
Flow
PARAGLIDERS
freedom

WELCOME

“Flow is a term used to describe the complete (body-mind-soul) feeling of being so totally engaged in an activity that there is a sense of complete immersion in the experience. Self-conscious thoughts give way to feeling at one with the activity and the environment, and time is no longer an ever-present consideration.”

The flow experience of flying a paraglider is what inspires us. The pure, focused concentration, the feeling of complete immersion with the environment, and the intrinsic pleasure in the activity itself are all hallmarks of the flow experience.

Thank you for flying Flow Paragliders. We hope you will be satisfied with this product and wish you many happy flights. We strongly recommend that you read this manual before the first flight. This manual is designed to help you to quickly familiarize with this beautiful glider.

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General Information

User manual for Freedom S, Freedom M, Freedom L and Freedom XL

The Flow Freedom is an easy and fun paraglider with excellent glide and a very efficient speed system designed as a mid to high end EN B class glider.

The Freedom is aimed at pilots who are willing to progress in the sport safely, chasing their first XC flights but who are also comfortable with the technical control of this type of glider.

The pilots should understand the implication of flying an EN B-class wing.

Please note that any changes to the paraglider will invalidate the result of the certification. Correct usage of the glider is the pilot‘s responsibility. The manufacturer and distributor do not accept liability for loss or damage as a result of the misuse of this paraglider. It is the pilot’s responsibility to comply with legal regulations and to maintain the airworthiness of the aircraft.

The Freedom has a high level of passive safety. The Freedom has been certified as EN B, having met all the requirements of EN 926-2 / 2013 and LTF NFL II 91/09.

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PILOT'S PROFILE

The Freedom was designed to be nothing but a fun paraglider. With that in mind we concentrated on the handling and the fun factor of the glider. Coupled with a shark nose profile and reduced line plan we have a glider which sits in middle to high end of the EN B class.

As the name suggests, "Freedom" was designed for the explorer and the traveler. A glider to give the sense of freedom to traverse the unknown and venture to new horizons, safely.

With vol-bivouac in mind, we made a glider which offers a great speed range and stability when flown in the most challenging air. The combination of our shark-nose profile and internal construction combined with lightweight materials makes the Freedom to be the ideal piece of kit to any serious adventurer. A moderate AR of 5.6 allows pilots to slow the glider down to top land in those tight spots and to launch from the most demanding places. The cohesion of the glider enables pilots to push hard against headwind with no worries.

Build with 65 cells. A 3 liner with an optimized line layout and a "solid" internal structure. Our shark nose profile coupled with a reduced line plan to reduce drag, add not only stability and collapse resistance but also pitch stability which reflects into an enjoyable flying experience and ultimately – true performance. The sense of a safe and agile glider is always present on the Freedom.

The number of cells and the shark nose profile resembles an EN C glider, but the reduced AR and passive safety makes the Freedom well and truly a high-end B glider.

Freedom is built extensively of lightweight materials Our preference was for the long-lasting yet lightweight Porcher Skytex 27g.

The benefits:

- Weight reduction and smaller packing volume.
- Most importantly a lightweight construction gives the Freedom an enhanced handling and benign behavior post collapse when compared to a normal weight glider.
- Easy Inflation in nil wind.

SPECIFICATIONS

freedom	S	M	L	XL
FLAT AREA	23.45 m2	26.55 m2	27.9 m2	30.40 m2
PROJECTED AREA	20.15 m2	22.82 m2	24.02 m2	26.15 m2
FLAT WINGSPAN	11.47 m	12.23 m	12.54 m	13.10 m
PROJECTED SPAN	9.25 m	9.85 m	10.7 m	10.58 m
ASPECT RATIO	5.6	5.6	5.6	5.6
PROJECTED AR	4.21	4.21	4.21	4.21
NUMBER OF CELLS	65	65	65	65
GLIDER WEIGHT	3.9	4.1	4.4	4.6
TAKE OFF WEIGHT	60-85	75-100	90-115	105-130
CERTIFICATION	LTF/EN B	LTF/EN B	LTF/EN B	LTF/EN B

TAKE-OFF, FLIGHT, AND FLYING TECHNIQUES

The Flow Freedom should be flown as a normal paraglider. However, there are several points listed below which should help you to familiarize with your new paraglider quicker.

The Freedom was designed as a foot launchable solo paraglider and can also be tow-launched. It is the pilot's responsibility to use suitable harness attachments and release mechanisms and to ensure that they are correctly trained on the equipment and system employed.

Before Take-off

- Check the canopy for rips or tears. Also, inspect the internal structure (ribs, diagonals) and seams.
- Check that the lines are not damaged or tangled.
- Check if the quick links connection between lines to the risers are undamaged and tightened.
- Check that the risers are not damaged or twisted.
- Check if the speed system works freely and that the lines are long enough.
- Check that the brake handles are correctly attached and that each line runs freely through the pulley.

Take-off

Lay the paraglider out with the leading edge in a horseshoe shape. Hold the A risers close to the quick links and move forward until the lines get stretched. You should now be perfectly centred with your wing. With no wind or light headwind, with lines stretched, The Flow Freedom inflates rapidly and rises over your head with some dynamic steps. We recommend that you do not pull risers too forward or down, which could cause a collapse of the leading edge, but simply follow them until the glider reaches its angle of flight. It is important that the centre of gravity of your body stays in front of your feet during the inflation of the glider to constantly load the risers. A controlled inflation allows you to check the canopy and lines during the last phase as it comes up and thus avoids the need to use brakes. Depending on the wind conditions or the slope, an adequate use of brakes can help you to take-off quicker.

Landing

Because of the exceptional glide for this type of glider, high caution is recommended in the stages of approaching and landing. The Flow Freedom is a fast glider, any action on the brakes may cause significant reactions. It is therefore recommended to execute the first flights in a familiar environment and under easy conditions. With negative steering, there is more time for the manoeuvres to be performed steadily, which results in reducing the pendulum movements of the paraglider. Reminder: Negative steering involves applying the brakes symmetrically by about 30% of the maximum range to slow the paraglider and a simultaneous turning by means of releasing the outside brake. Speeding up just prior to landing allows a more effective flare and therefore a gentler landing.

Turning

Flow Freedom was designed to perform well in turns. Negative steering (see above) on one hand slows the paraglider in certain phases of the flight and on the other hand reduces excessive rolling during turn reversals. It is not only designed to turn (with approx. 30% brake) but also to fly slowly in order to help identify the areas of lift and to keep the paraglider flatter to minimize the sink rate in a turn (with 15% brake). Symmetrical brake-input at 20-30 % enables you to keep your wing under control – to brake further when pitching and to release when the canopy banks up.

RAPID DESCEND

Techniques

In order to descend, the paraglider must fly away from the areas of lift. In case any problems occur, the following techniques might be used to increase the sink rate.

- *Spiral Dive:* The Flow Freedom is a manoeuvrable wing which responds to any input easily. To initiate the spiral, apply one brake progressively to about 35% and hold it in its position. The speed of rotation will increase progressively as well as the pressure on the brake and the centrifugal force that is perceived. The angle or the speed of rotation can be decreased or increased by releasing or pulling the brake by several centimetres. Once mastered the spiral allows you to descend by more than 10 m/s. Movements which are extremely abrupt or badly synchronized or very quick initiation of the spiral can result in an asymmetrical collapse or a spin. CAUTION: Spiral Dives should be executed with care. To exit the spiral dive, the kinetic energy must be converted to potential energy by slowly releasing the inside brake.

- *B-line Stall:* Grasp the B risers at the quick links and pull them down symmetrically. The paraglider will enter a B-line stall and drop backwards before stabilizing overhead. The descent rate increases to 6 - 8 m/s. To exit the B-line stall raise both hands together in a single, positive movement so that the risers are at full extension. On releasing the B-risers, your Freedom should return immediately to normal flight.

- *Big Ears*: Big ears is a moderate descent method, reaching -3 or -4 m/s, speed reduces slightly between 3 and 5 km/h and piloting becomes limited. The angle of attack and the wing loading also increases.

  Push on the accelerator to restore the wing's horizontal speed and the angle of attack. To activate ears, take the line ***amain3*** and simultaneously, smoothly pull them outward and downward. The wingtips will fold in. Let go of the lines and the ears will re-inflate automatically. If they do not re-inflate, gently pull on one of the brake lines first and then on the opposite side. For directional control while using the Big Ears, use weight shift.

  We recommend the pilot to re-inflate asymmetrically, to avoid unnecessary change on the angle of attack, more so if you are flying near the ground or flying in turbulence.

PERFORMANCE & USE OF BRAKES

Use of Brakes

Flow Freedoms best glide is at a trim speed (no brakes) – about 38 km/h. The minimum sink rate is achieved by applying approx. 15% of the brakes. When using more than 30% of the brakes, the aerodynamics and the performance of the glider are likely to deteriorate and the effort to manoeuvre will increase quickly. In case of extremely high brake pressure there is a great risk of a stall. Which occurs at a full brake travel (100% of the brakes) 65cm. In normal flying conditions the optimal position for the brakes, in terms of performance and safety, is within the top third level of the braking range.

Use of Speed Bar

Flow Freedom is equipped with a speed system. The profile of Freedom has been designed to fly stable through its entire speed range. It is useful to accelerate when flying in strong winds or in extreme descending air. For fitting and positioning the speed bar consult the instructions of the harness manufacturer. Before every flight check that the speed bar works freely and that the lines are long enough to ensure that it is not engaged permanently. Use of the speed bar increases the maximum speed of the paraglider by up to 30% of the trim speed. However, it does reduce the angle of attack and therefore there is a risk of a frontal (or asymmetric) collapse. We therefore do not advise to use the speed bar near the ground.

ASSYMETRIC & FRONTAL COLLAPSES

Despite the tests proving Freedom recovers on its own after collapses, it is a EN B glider therefore active piloting is recommended in case of an asymmetric or frontal collapse. Active piloting will reduce the loss of altitude and a change of direction.

Asymmetric Collapse

Despite the great stability of the profile of the Freedom, heavy turbulent conditions may cause part of the wing to collapse asymmetrically. This usually happens when the pilot has not foreseen this possible reaction of the wing. To prevent the collapse from happening, pull the brake line corresponding to the compromised side of the wing, this will increase the angle of attack. If the collapse does happen, the Freedom will not react violently, the turn tendency is very gradual and it is easily controlled. Lean your body towards the side that is still flying in order to counteract the turn and to maintain a straight course, if necessary slightly slow down the same side. The collapse will normally open by itself but if that does not happen, pull completely on the brake line on the side, which has collapsed (100%). Do this with a firm movement. You may have to repeat this operation to provoke the re-opening. Take care not to over-brake on the side that is still flying (turn control) and when the collapse has been solved; remember to let the wing recover its flying speed.
Bring both brakes down symmetrically to speed up the reopening of the paraglider, and then raise your hands back up immediately.

Frontal (Symmetric) Collapse

The profile of the Freedom has been designed to widely tolerate extreme changes in the angle of attack. A symmetric collapse may occur in heavy turbulent conditions, on entry or exit of strong thermals or lack of adapting the use of the accelerator to the prevailing air conditions. Symmetrical collapses usually re-inflate without the glider turning, but you can symmetrically apply the brake lines with a quick deep pump to quicken the re-inflation. Release the brake lines immediately to recover optimum flight speed.

FULL STALL

Certain behaviour or weather conditions can cause a full stall. This is a serious deviation from normal flight and can be difficult to manage. If a stall occurs at less than 100 m above the ground, throw your reserve parachute. Main causes of a full stall:

- A poorly timed or an extensive use of brakes when the air speed of the wing is reduced.
- Soaked or heavily drenched leading edge (from rain or a cloud) can result in a stall due to an uneven airflow over the leading edge.

Whatever the cause, a full stall can be either symmetrical or a in a configuration of a spin.

Your first reaction should be to fully raise both hands. This normally allows the glider to return to normal flight but If nothing happens after a few seconds, apply the speed bar to encourage the wing to regain normal flight. Ensure the glider has returned to normal flight (check your airspeed) before using the brakes again.

FLYING WITHOUT BRAKES

If a brake line or pulley breaks, it is possible to fly the Freedom using the C-risers (rear riser). The movements must be well controlled as the deformation of the wing, due to the traction on the B-risers, is greater than that produced by using the brakes.

CRAVATS

If the tip of your wing gets stuck in the lines, this is called a cravat. Due to the large amount of drag, cravats can turn your wing into a spiral dive very quickly. This can be disorientating and difficult to control if allowed to develop. To recover from a cravat immediately, anticipate the movement of the wing, first stabilise the direction of your wing with outside brake and weight shift. Once you have control of the rotation and sink rate, apply strong deep pumps of the brake on the cravated side whilst weight shifting away from the cravat. It is important to lean away from the cravat otherwise you risk spinning or deepening the spiral. The aim is to empty the air out of the wing tip whilst it is unloaded. Correctly done, this action will clear the cravat. If it is a very large cravat and the above options have not worked, then a full stall is another option. This should not be attempted unless you know what you are doing and have a large amount of altitude. Remember, if the rotation is accelerating and you are unable to re-open the wing or control the decent rate, you should throw your reserve parachute whilst you still have enough altitude.

SIV

All manoeuvres should be carried out under supervision of experienced paragliding instructors, above water and with a rescue boat.

ADJUSTMENT OF THE HARNESS

For test flights, the pilots used ABS harnesses with the following set-up:

SIZE	Distance from seat board	Distance between hang points
FREEDOM S	43cm	44cm
FREEDOM M	43cm	46cm
FREEDOM L	43cm	46cm
FREEDOM XL	43cm	46cm

We recommend adjusting the harness in a very similar way to the test adjustment. Excessive cross-bracing increases the risk of twisting the risers. A looser setting will result in a tendency to lean towards the collapsed side. Lower hang points reduce the roll-stability of your harness and can slow down the reopening of asymmetric collapses. Higher hang points (+ 2 up to +4 cm) have no influence on inflight safety and can therefore be tolerated.

MAINTENANCE & CHECKS

The Flow Freedom is a robust piece of equipment but as any flying aircraft it should be technically periodically checked to ensure proper airworthiness.

Maintenance Tips

The life of your paraglider therefore depends largely on the care which you maintain and use it. To maximize life span of your wing, respect the following rules:

- Avoid dropping the canopy on its top surface or on its leading edge during inflation or landing.
- Avoid dragging it across the ground when moving it.
- Don‘t expose it unnecessarily to sunlight.
- Choose a packing technique that doesn‘t damage the plastic rods and that doesn‘t crease the internal structure excessively.

Always use the protective bag to avoid direct contact with the harnesses and buckles of any friction between the blade and the rucksack.
Never store your paraglider when it is damp.
If immersed in sea water rinse immediately with fresh water. Do not use any detergents. Dry your paraglider away from direct light in a dry and well-aired place.
Empty any foreign bodies from your paraglider regularly, for example sand, stones or animal or vegetable matter which may eventually decay. Twigs, sand, pebbles, etc. damage tissue in successive folds and organic debris of vegetable or animal origin (insects) can promote mould growth.

Periodic Inspections

The paraglider has undergone a series of tests during the production process and consequent flight tests before the delivery. It is delivered with a standard brake setting same to the one used during the testing. Periodic Checks & Repairs: for safety reasons, it is recommended that the paraglider is checked at least once a year, or after 100 hours and anytime there is a change in its behaviour. However, if you are a frequent flyer (more than 100 hrs per year), then we recommend that you check your glider every 100 hours. The person performing the check should inform you about the condition of your glider and if some parts will need to be checked or changed before the next normal service check period.

WARRANTY

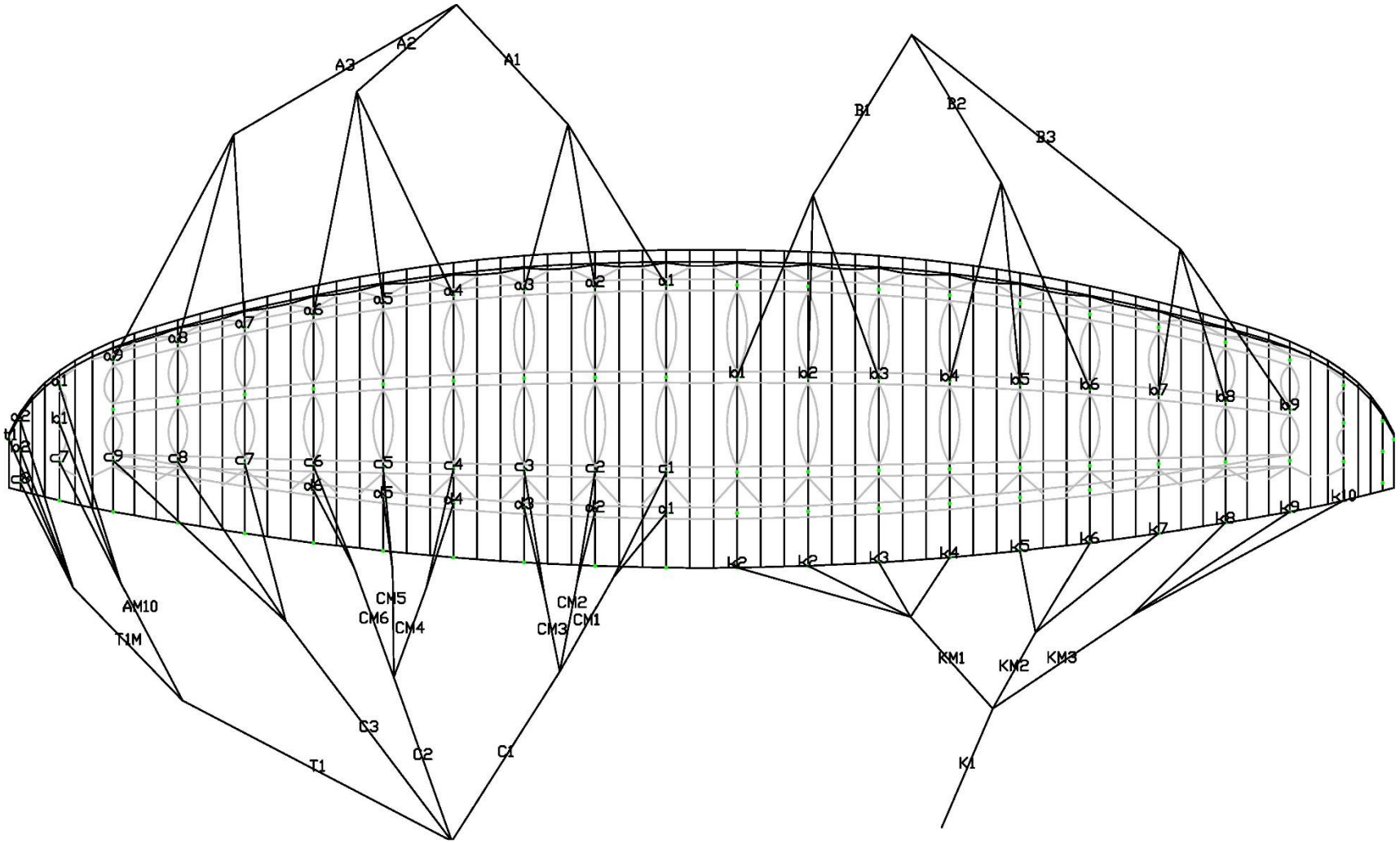
The Flow Freedom is guaranteed for two years or 250 hours against any production fault since the date of purchase.
The guarantee does not cover:

- Damage caused by misuse
- Neglecting the regular maintenance
- Overloading or misuse of the glider
- Damage caused by inappropriate landings

SUMMARY

Safety is the single most important thing in our sport. We recommend to always be alert of the weather, fly as regularly as you can and ground handle as much as possible. Practicing ground handling will keep your skills alive and will support you especially when conditions at launch aren't perfect or the site is difficult.
Please always respect the weather! Monitor the conditions and the forecast closely and understand which conditions are right for your level of flying or for flying in general. Lots of pilots get hurt due to misjudging weather conditions and we don't want you to be one of them.
We would also like to emphasise respecting our beautiful nature and looking after your flying sites. If you need to dispose the wing, please don't dispose of it in the normal household waste but in an environmentally responsible way. If you are unsure, please contact your council.

LINE PLAN

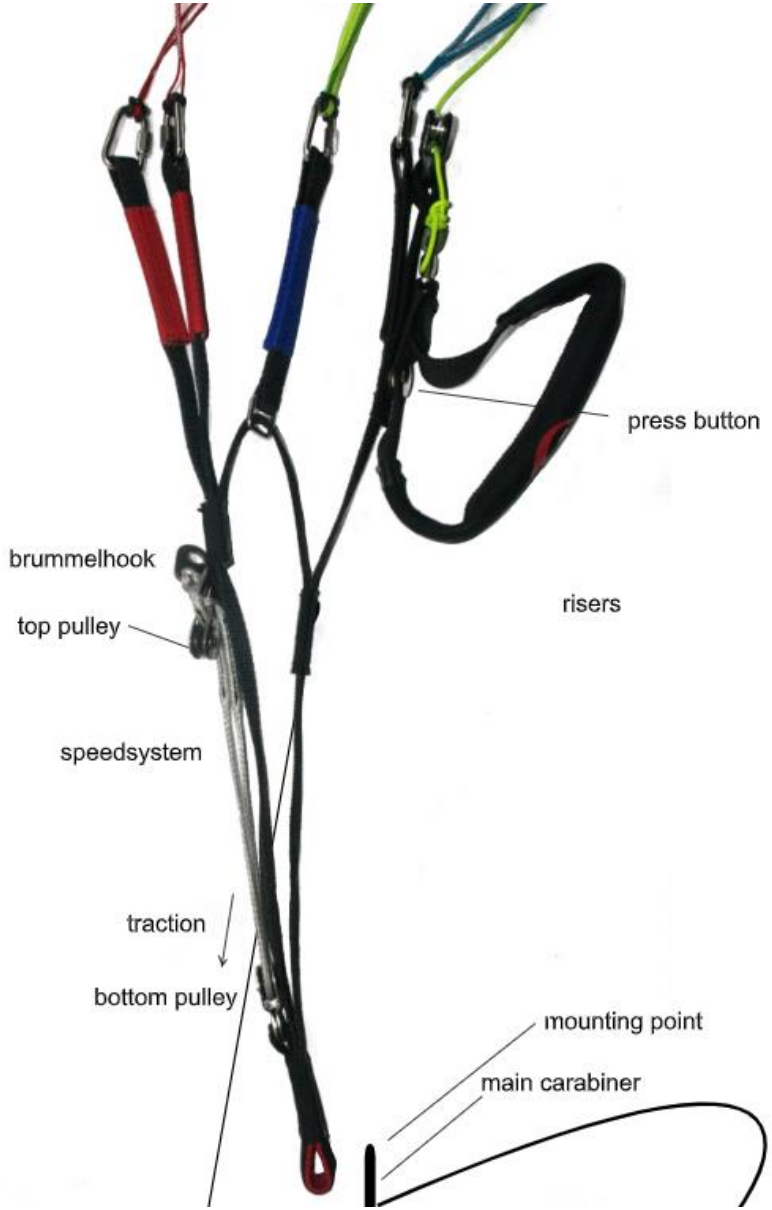

A3
A2
A1
B1
B2
B3
AM10
T1M
CM5
CM6
CM4
CM2
CM3
CM1
KM1
KM2
KM3
C3
C2
C1
T1
K1

RISER DIAGRAM

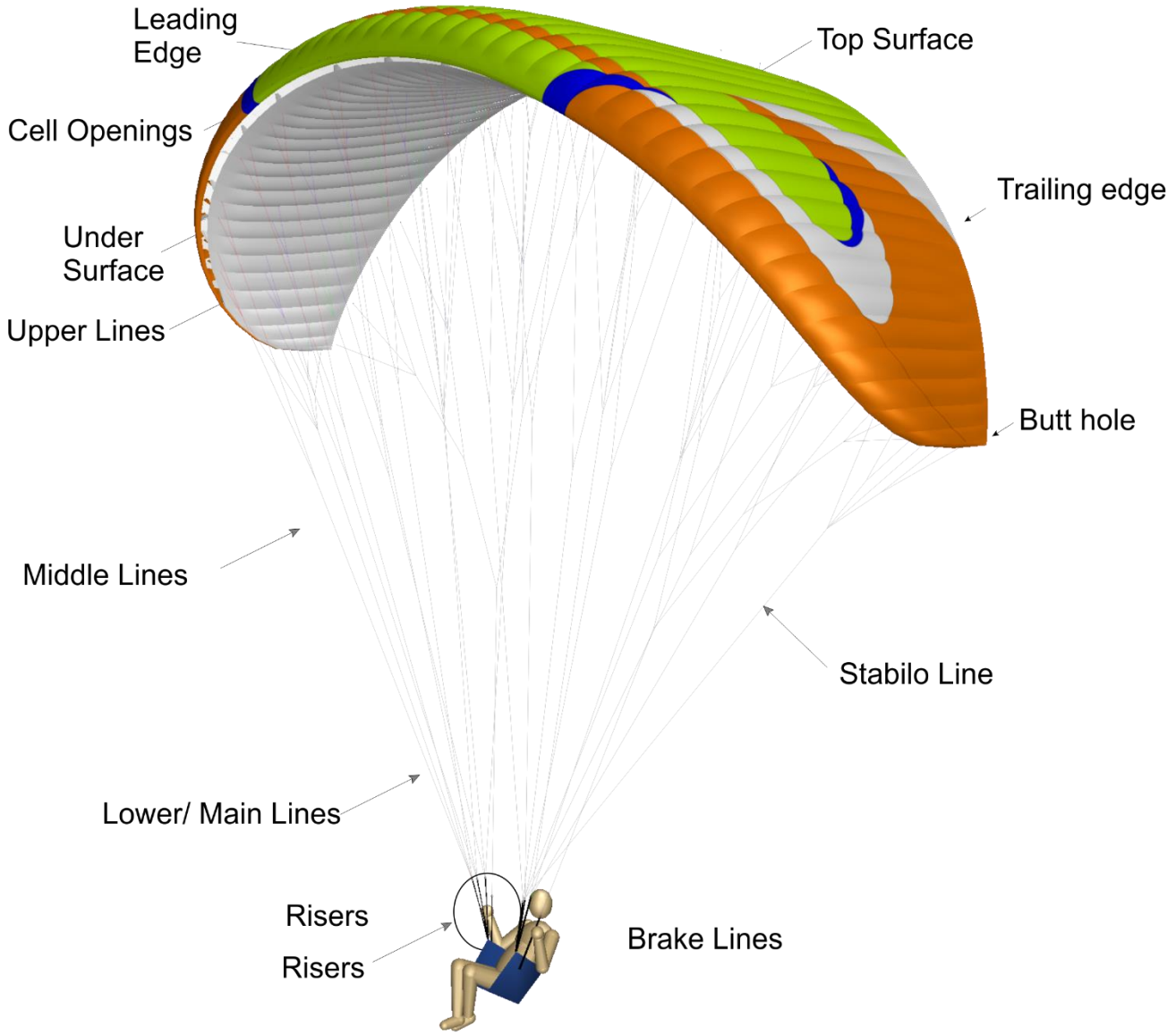
Sizes S, M, L and XL

NON-ACCELERATED		*ACCELERATED*	
A	500mm	A	375mm
A1	500mm	A1	375mm
B	500mm	B	335mm
C	500mm	C	500mm

*Difference should not be more than +/- 5mm



OVERALL ILLUSTRATION



MATERIALS

CANOPY	FABRIC CODE	SUPPLIER
Upper surface	Dominico DOKDO 30D MF	Dominico Tech Corp. - Korea
Bottom Surface	Porcher 7000 E71	Porcher Industries - France
Supported Ribs	Porcher 7000 E91	Porcher Industries - France
Unsupported Ribs	Porcher 9017 E29	Porcher Industries - France
Leading Edge Reinforcement	2.5/1.8/ Plastic pipe	Porcher Industries - France
Thread	210D/3, 420D/3	Coats Thread - Thailand
SUSPENTION LINES	**FABRIC CODE**	**SUPPLIER**
Upper Cascades	Edelrid 8000U 130/090/070/050kg - Edelrid 9200 030kg	EDELRID - Germany
Middle Cascades	Edelrid 8000U 190/130/090/070/050kg Edelrid 9200 030kg	EDELRID - Germany
Main Lines	Edelrid 8000U 360/190/130/050kg Liros DSL 140kg	EDELRID - Germany LIROS GmbH - Germany
RISERS	**FABRIC CODE**	**SUPPLIER**
Shackles	Maillon Rapide	ANSUNG PRECISION - Korea
Riser Webbing	12mm zero stretch polyester webbing	Guth&Wolf GmbH - Germany
Pulleys	Pulleys Ronstan ball bearing	Ronstan - Australia

In case of any doubts regarding the information in the manual contact your FLOW PARAGLIDERS dealer.
For spare parts or information in how to obtain them get in contact with us directly or with your local dealer.

Flow Paragliders PTY LTD. – 11/2 Executive Drive, Burleigh Waters QLD 4220, Australia – info@flowparagliders.com.au

LINE MEASUREMENTS

The overall length (riser lines + mid lines + upper lines) has to be checked under 5Kgs of tension. The difference between the measured length and the original length should not exceed +/- 10mm. The changes that could appear are a slight shrink on the C's and/or a slight stretch on the A's and B'S The consequences of these changes can include a slower trim speed, difficult inflation etc.

Dimensions given in the user's manual was checked by the testing laboratory

TOTAL LINE LENGTHS:

FREEDOM S

	A	B	C1	C2	STB	Brake
1	7110	7030	7130	7235	6515	7065
2	7025	6945	7050	7155	6495	6925
3	7055	6975	7075	7165	6580	6865
4	7015	6945	7035	7120	6340	6735
5	6910	6840	6925	6995	6325	6625
6	6915	6860	6935	6980	6385	6605
7	6820	6765	6850		6480	6510
8	6685	6650	6730			6385
9	6640	6650	6725			6385

FREEDOM M

	A	B	C1	C2	STB	Brake
1	7580	7510	7630	7740	6875	7690
2	7490	7420	7545	7655	6855	7545
3	7520	7450	7570	7665	6945	7480
4	7480	7420	7525	7620	6690	7340
5	7365	7310	7410	7485	6675	7225
6	7375	7330	7420	7470	6738	7200
7	7270	7225	7315		6840	7100
8	7130	7100	7185			6970
9	7080	7100	7180			6810

FREEDOM L

	A	B	C1	C2	STB	Brake
1	7885	7810	7935	8050	7100	7875
2	7790	7715	7845	7925	7080	7725
3	7820	7750	7870	7970	7170	7660
4	7780	7700	7800	7900	6905	7515
5	7660	7585	7680	7760	6890	7395
6	7670	7610	7690	7745	6960	7370
7	7560	7505	7590		7065	7265
8	7415	7375	7455			7130
9	7365	7375	7450			6960

FREEDOM XL

	A	B	C1	C2	STB	Brake
1	8103	8012	8135	8254	7165	8264
2	8004	7911	8047	8165		8106
3	8039	7947	8070	8174		8034
4	8028	7945	7057	8159		7889
5	7909	7831	7937	8015		7766
6	7919	7852	7942	7997		7735
7	7793	7733	7821			7585
8	7642	7604	7681			7445
9	7592	7601	7677			7277
10	7386	7363	7462			
11	7181	7236	7340			

LINE TYPES

Name	Manufacturer	Name	Manufact.	Name	Manufact.	Name	Manufact.	Name	Manufact.	Name	Manufact.
A-Lines		**B-Lines**		**C-Lines**		**C'-Lines**		**BK-Lines**		**Stabi-Lines**	
a1	8000U-130	**b1**	8000U-130	**c1**	8000U-90	**d1**	8000U-70	**k1**	8000U-50	**a10**	8000U-70
a2	8000U-130	**b2**	8000U-130	**c2**	8000U-90	**d2**	8000U-70	**k2**	8000U-50	**b10**	8000U-70
a3	8000U-130	**b3**	8000U-130	**c3**	8000U-90	**d3**	8000U-70	**k3**	8000U-50	**c10**	8000U-70
a4	8000U-130	**b4**	8000U-130	**c4**	8000U-90	**d4**	8000U-70	**k4**	8000U-50	**a11**	8000U-70
a5	8000U-130	**b5**	8000U-130	**c5**	8000U-90	**d5**	8000U-70	**k5**	8000U-50	**a12**	8000U-70
a6	8000U-130	**b6**	8000U-130	**c6**	8000U-90	**d6**	8000U-70	**k6**	8000U-50	**b11**	8000U-70
a7	8000U-130	**b7**	8000U-130	**c7**	8000U-90			**k7**	8000U-50	**c11**	8000U-70
a8	8000U-130	**b8**	8000U-130	**c8**	8000U-90			**k8**	8000U-50		8000U-70
a9	8000U-130	**b9**	8000U-130	**c9**	8000U-90			**k9**	8000U-50		8000U-70
								k10	8000U-50		8000U-70
A1	8000U-280	**B1**	8000U-280	**CM1**	8000U-130			**KM1**	8000U-90	**AM10**	8000U-90
A2	8000U-280	**B2**	8000U-280	**CM2**	8000U-130			**KM2**	8000U-90	**T1M**	8000U-90
A3	8000U-230	**B3**	8000U-230	**CM3**	8000U-130			**KM3**	8000U-90		
				CM4	8000U-130						
				CM5	8000U-130			**K1**	7850-240	**T1**	8000U-130
				CM6	8000U-130						
				C1	8000U-230						
				C2	8000U-230						
				C3	8000U-230						