Flow
PARAGLIDERS



COSMOS 2

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 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 sure signs of the flow experience.

Thank you for flying Flow Paragliders. We 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 Cosmos2 XXS Cosmos2 XS, Cosmos2 S, Cosmos2 M and Cosmos2 L

The Flow Cosmos2 is an easy and fun paraglider with excellent glide and a very efficient speed system designed as a low end EN B class glider. The Cosmos2 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 Cosmos2 has a high level of passive safety. The Cosmos2 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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Flow Paragliders PTY LTD – 7/249 Scottsdale Drive, Robina QLD 4226, Australia – info@flowparagliders.com.au

PILOT'S PROFILE

The Cosmos2 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 the low end of the EN B class.

Its passive safety makes the ideal glider to progress safely in the sport and to gain experienced as a first Cross-Country glider. It has a usable performance and handling for even those pilots with more experience who often fly in the B category. Novice pilots will enjoy its passive safety and experienced pilots will be delighted to explore the fun factor and amazing LD and real-world performance the Cosmos2 delivers.



SPECIFICATIONS

COSMOS 2	XXS	XS	S	M	L
FLAT AREA	22.1m2	24.2m2	25.80m2	27.3m2	29.3 m2
PROJECTED AREA	19.14m2	21m2	22.22m2	23.44m2	25.47m2
FLAT WINGSPAN	10.70m	11.18m	11.55m	11.88m	12.34m
PROJECTED SPAN	8.60m	9.05m	9.29m	9.48m	10.03m
ASPECT RATIO	5.17	5.17	5.17	5.17	5.17
PROJECTED AR	3.9	3.9	3.9	3.9	3.9
MAX CHORD	2.55	2.65	2.73	2.81	2.93
NUMBER OF CELLS	50	50	50	50	50
GLIDER WEIGHT	4.1	5.0	5.5	5.8	6.2
TAKE OFF WEIGHT	50-75	60-85	70-95	85-105	95-120
CERTIFICATION	LTF/EN A and B	LTF/EN B	LTF/EN B	LTF/EN B	LTF/EN B

TAKE-OFF, FLIGHT, AND FLYING TECHNIQUES

The Cosmos2 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 Cosmos2 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 if lines are not damaged or tangled.
- Check the quick links connection between lines to the risers are undamaged and tightened.
- Check if 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 Cosmos 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 stay 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 Cosmos2 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 Cosmos2 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 Drive*: The Cosmos2 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: A deep spiral is no harmless manoeuvre. The kinetic energy obtained must be reduced by slow releasing of the inside brake.

- *B-line Stall:* 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 Cosmos2 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 Cosmos2's 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 Cosmos2 is equipped with a speed system. The profile of Cosmos2 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 Cosmos2 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 Cosmos2, 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 incidence. If the collapse does happen, the Cosmos2 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 Cosmos2 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 Cosmos2 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
COSMOS2 XXS	43cm	44cm
COSMOS2 XS	43cm	44cm
COSMOS2 S	43cm	46cm
COSMOS2 M	43cm	46cm
COSMOS2 L	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 Cosmos2 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 on its leading-edge during inflation or landing.
- Avoid dragging it across the ground when moving it.
- Avoid exposing your glider unnecessarily to sunlight.
- Choose a packing technique that doesn‘t damage the plastic rods and that doesn‘t crease the internal structure excessively. A concertina type bag is the ideal bag for folding the Cosmos2.

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 get your glider every 100 hours. The checker 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

Flow paragliders’ warranty covers any material defects or any production fault for two years or 250 hours since the date of purchase.
The guarantee does not cover:

- Damage caused by misuse

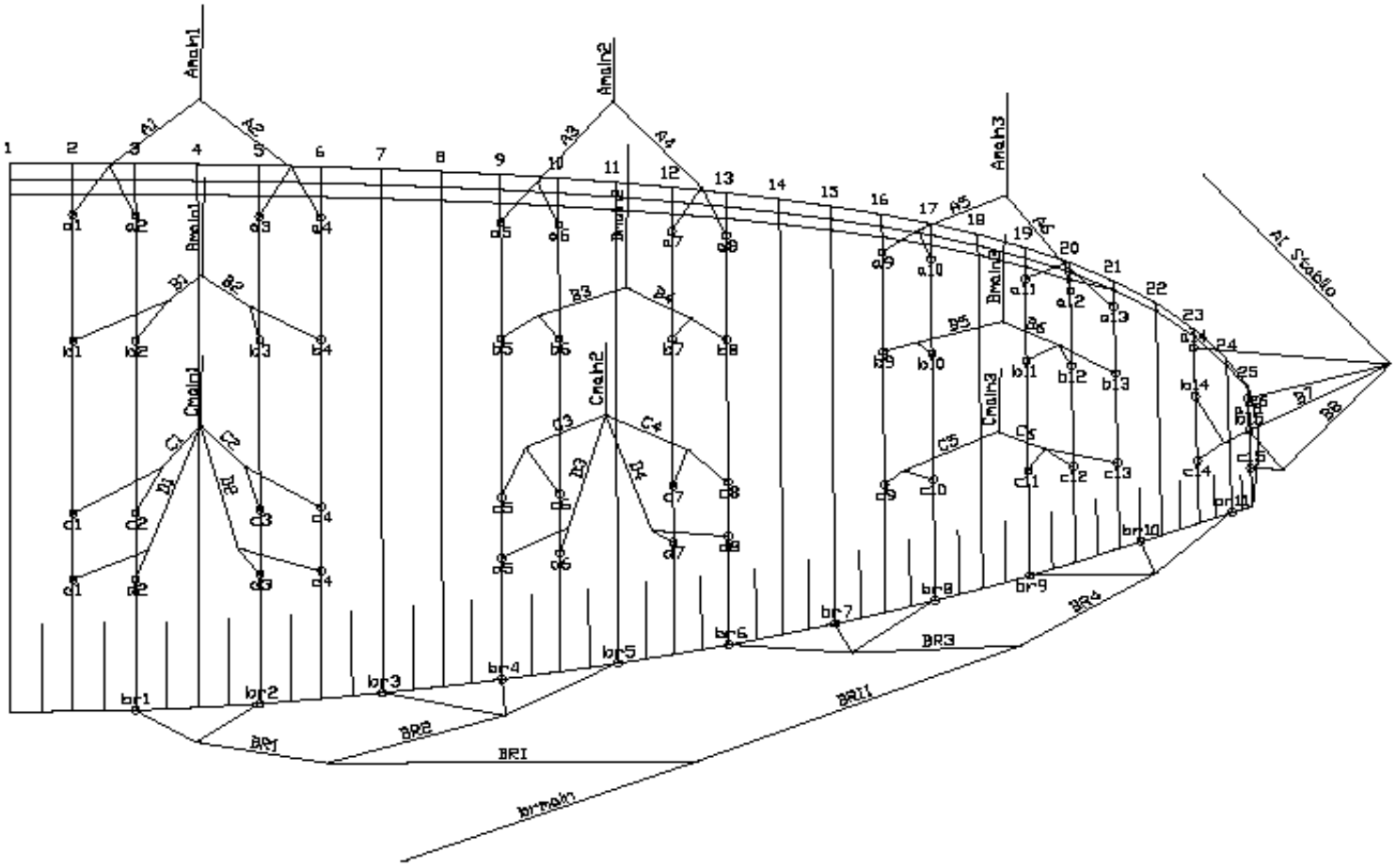
- Neglecting the regular maintenance
- Overloading or misuse of the glider
- Damage caused by inappropriate landings

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.

COSMOS 2

Line Plan



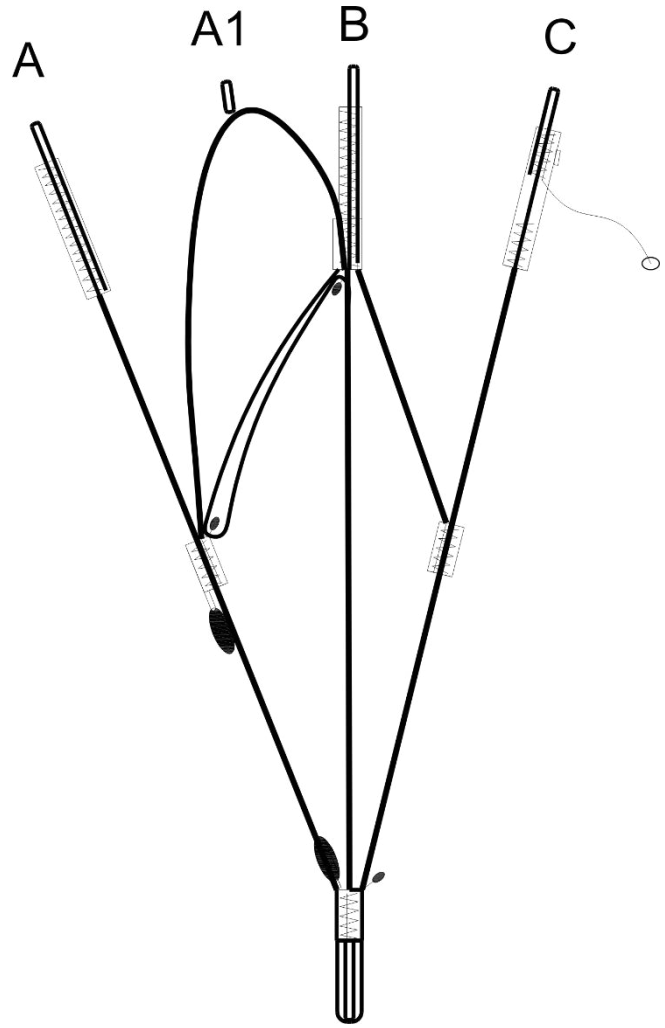
Flow PARAGLIDERS

RISER DIAGRAM

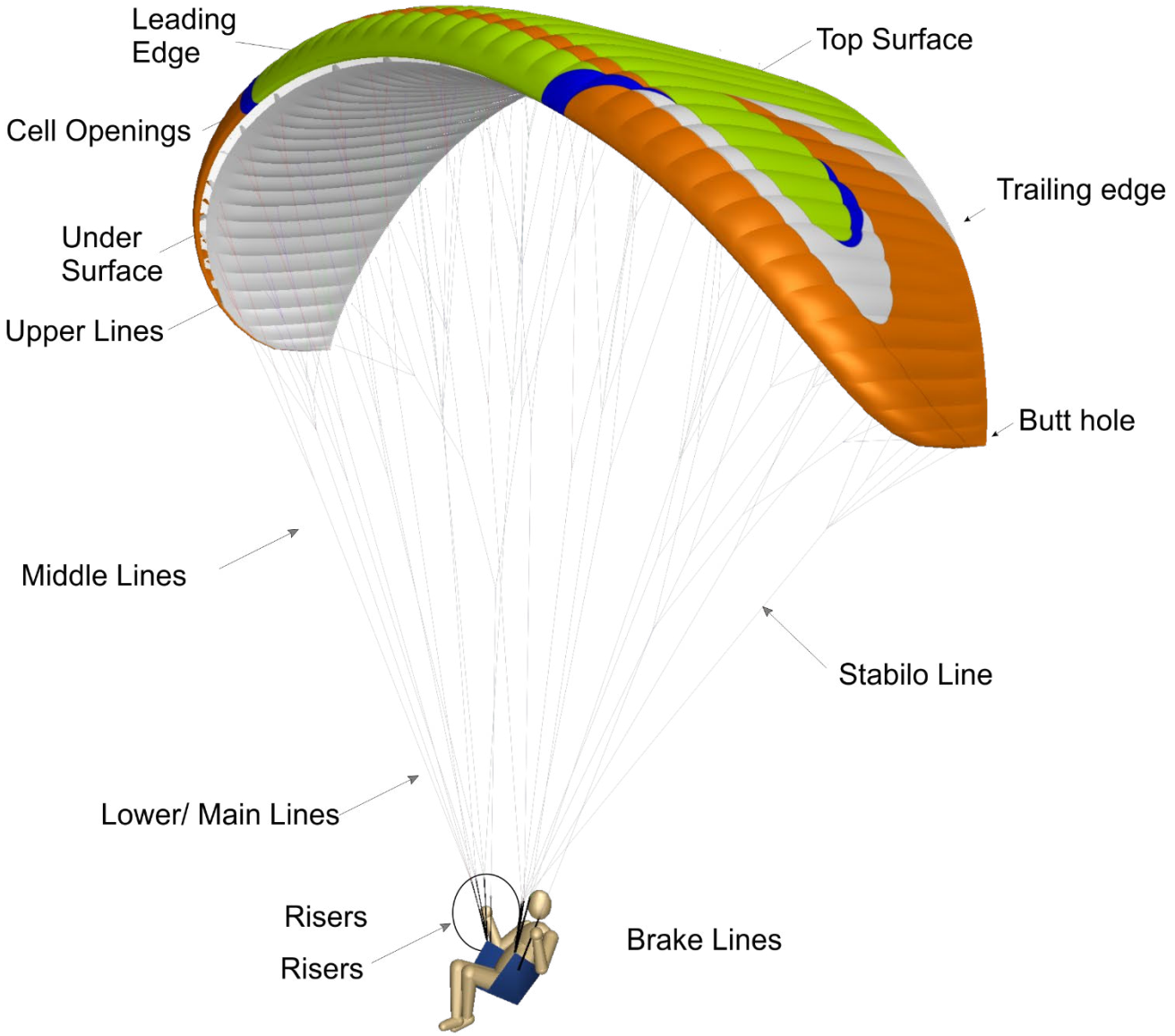
Sizes XS, XS, S, M and L.

NON-ACCELERATED		*ACCELERATED*	
A	466mm	A	334mm
A1	466mm	A1	356mm
B	466mm	B	378mm
C	466mm	C	466mm

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



OVERALL ILLUSTRATION



MATERIALS

CANOPY	FABRIC CODE	SUPPLIER
Upper surface	Porcher Skytex 38	Porcher Industries - France
Botton Surface	Porcher Skytex 38	Porcher Industries - France
Supported Ribs	Porcher Skytex 40 hard	Porcher Industries - France
Unsupported Ribs	Porcher Skytex 40 hard	Porcher Industries - France
SUSPENTION LINES	FABRIC CODE	SUPPLIER
Upper Cascades	Liros DSL 070	LIROS - Germany
Middle Cascades	LirosDSL 070/ PPSL 160	LIROS - Germany
Main Lines	Liros PPSL 160/ 200/275 -10-200-040	LIROS GmbH – Germany/Elderid -Germany
RISERS	FABRIC CODE	SUPPLIER
Shackles	Maillon Rapide	Maillon Rapide - France
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. – 7/249 Scottsdale Drive, Robina QLD 4226, 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.

BRIDLE CHECK LENGHTS:

Cosmos2 XXS

a1	6784	b1	6672	c1	6727	d1	6844	br1	7197
a2	6738	b2	6632	c2	6682	d2	6797	br2	6979
a3	6713	b3	6619	c3	6674	d3	6787	br3	6836
a4	6728	b4	6628	c4	6687	d4	6790	br4	6691
a5	6712	b5	6615	c5	6678	d5	6781	br5	6713
a6	6699	b6	6610	c6	6672	d6	6774	br6	6589
a7	6681	b7	6600	c7	6660	d7	6773	br7	6466
a8	6696	b8	6616	c8	6668	d8	6760	br8	6440
a9	6643	b9	6571	c9	6633			br9	6359
a10	6611	b10	6543	c10	6595	Stabio1	6163	br10	6309
a11	6535	b11	6485	c11	6530	Stabio1	6177	br11	6308
a12	6482	b12	6436	c12	6484	Stabio1	6254		
a13	6474	b13	6485	c13	6483				
a14	6290	b14	6436	c14	6312				

Cosmos2 XS

a1	6784	b1	6672	c1	6727	d1	6844	br1	7197
a2	6738	b2	6632	c2	6682	d2	6797	br2	6979
a3	6713	b3	6619	c3	6674	d3	6787	br3	6836
a4	6728	b4	6628	c4	6687	d4	6790	br4	6691
a5	6712	b5	6615	c5	6678	d5	6781	br5	6713
a6	6699	b6	6610	c6	6672	d6	6774	br6	6589
a7	6681	b7	6600	c7	6660	d7	6773	br7	6466
a8	6696	b8	6616	c8	6668	d8	6760	br8	6440
a9	6643	b9	6571	c9	6633			br9	6359
a10	6611	b10	6543	c10	6595	Stabio1	6163	br10	6309
a11	6535	b11	6485	c11	6530	Stabio1	6177	br11	6308
a12	6482	b12	6436	c12	6484	Stabio1	6254		
a13	6474	b13	6485	c13	6483				
a14	6290	b14	6436	c14	6312				

Cosmos2 S

a1	6971	b1	6856	c1	6910	d1	7029	br1	7378
a2	6928	b2	6816	c2	6870	d2	6990	br2	7135
a3	6900	b3	6795	c3	6857	d3	6978	br3	6977
a4	6910	b4	6802	c4	6866	d4	6949	br4	6834
a5	6896	b5	6795	c5	6856	d5	6972	br5	6854
a6	6880	b6	6778	c6	6835	d6	6955	br6	6744
a7	6855	b7	6763	c7	6825	d7	6931	br7	6612
a8	6866	b8	6769	c8	6827	d8	6915	br8	6593
a9	6790	b9	6696	c9	6765			br9	6518
a10	6750	b10	6657	c10	6734	Stabio1	6269	br10	6489
a11	6660	b11	6593	c11	6659	Stabio1	6270	br11	6521
a12	6597	b12	6549	c12	6609	Stabio1	6340		
a13	6586	b13	6548	c13	6609				
a14	6385	b14	6345	c14	6416				

Cosmos2 M

a1	7123	b1	6985	c1	7033	d1	7144	br1	7426
a2	7076	b2	6938	c2	6987	d2	7095	br2	7233
a3	7050	b3	6929	c3	6977	d3	7092	br3	7074
a4	7051	b4	6929	c4	6981	d4	7096	br4	6941
a5	7059	b5	6949	c5	7027	d5	7150	br5	6966
a6	7023	b6	6920	c6	6994	d6	7116	br6	6796
a7	6964	b7	6874	c7	6944	d7	7060	br7	6649
a8	6959	b8	6863	c8	6934	d8	7027	br8	6618
a9	6747	b9	6690	c9	6796			br9	6488
a10	6690	b10	6639	c10	6736	Stabio1	6156	br10	6444
a11	6582	b11	6530	c11	6629	Stabio2	6168	br11	6484
a12	6498	b12	6458	c12	6560	Stabio3	6295		
a13	6493	b13	6456	c13	6546				
a14	6272	b14	6232	c14	6308				

Cosmos2 L

a1	7490	b1	7362	c1	7428	d1	7565	br1	7960
a2	7445	b2	7320	c2	7388	d2	7517	br2	7731
a3	7426	b3	7303	c3	7373	d3	7503	br3	7562
a4	7438	b4	7320	c4	7389	d4	7512	br4	7414
a5	7415	b5	7306	c5	7380	d5	7504	br5	7457
a6	7405	b6	7296	c6	7365	d6	7483	br6	7289
a7	7392	b7	7287	c7	7348	d7	7468	br7	7123
a8	7409	b8	7304	c8	7364	d8	7454	br8	7102
a9	7345	b9	7251	c9	7306			br9	7030
a10	7310	b10	7217	c10	7271	Stabio1	6816	br10	7031
a11	7224	b11	7152	c11	7203	Stabio1	6830	br11	7096
a12	7163	b12	7100	c12	7150	Stabio1	6913		
a13	7147	b13	7102	c13	7148				
a14	6952	b14	6900	c14	6982				

LINE TYPES

Name	Manufacturer	Name	Manufacturer	Name	Manufacturer	Name	Manufacturer	Name	Manufacturer
a1	DSL70	b1	DSL70	c1	DSL70	d1	DSL70	br1	DSL70
a2	DSL70	b2	DSL70	c2	DSL70	d2	DSL70	br2	DSL70
a3	DSL70	b3	DSL70	c3	DSL70	d3	DSL70	br3	DSL70
a4	DSL70	b4	DSL70	c4	DSL70	d4	DSL70	br4	DSL70
a5	DSL70	b5	DSL70	c5	DSL70	d5	DSL70	br5	DSL70
a6	DSL70	b6	DSL70	c6	DSL70	d6	DSL70	br6	DSL70
a7	DSL70	b7	DSL70	c7	DSL70	d7	DSL70	br7	DSL70
a8	DSL70	b8	DSL70	c8	DSL70	d8	DSL70	br8	DSL70
a9	DSL70	b9	DSL70	c9	DSL70	d9	DSL70	br9	DSL70
a10	DSL70	b10	DSL70	c10	DSL70			Br10	DSL70
a11	DSL70	b11	DSL70	c11	DSL70			Br11	DSL70
a12	DSL70	b12	DSL70	c12	DSL70				
a13	DSL70	b13	DSL70	c13	DSL70				
a14	DSL70	b14	DSL70	c14	DSL70			BR1	DSL70
a15	DSL70	b15	DSL70	c15	DSL70			BR2	DSL70
								BR3	DSL70
A1	PPSL 160	B1	PPSL 160	C1	PPSL 160	D1	PPSL 160	BR4	DSL70
A2	PPSL 160	B2	PPSL 160	C2	PPSL 160	D2	PPSL 160		
A3	PPSL 160	B3	PPSL 160	C3	PPSL 160	D3	PPSL 160	BRI	DSL70
A4	PPSL 160	B4	PPSL 160	C4	PPSL 160	D4	PPSL 160	BRII	DSL70
A5	PPSL 160	B5	PPSL 160	C5	PPSL 160				
A6	PPSL 160	B6	PPSL 160	C6	PPSL 160			brmain	10-200-040
A7	DSL 70	B7	DSL 70	C7	DSL 70				
AI	PPSL 275	BI	PPSL 200	CI	PPSL 200				
AII	PPSL 275	BII	PPSL 200	CII	PPSL 200				
AIII AIV	PPSL 200 PPSL 160	BIII	PPSL 160	CIII	PPSL 160				