Flow
PARAGLIDERS

FUSION

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.

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General Information

User manual for Fusion S, Fusion M, Fusion ML and Fusion L

This manual offers all the necessary information that will familiarise you with the main characteristics of your new paraglider. Although this manual informs you about your glider, it does not offer the instruction requirements necessary for you to be able to pilot this type of wing. Flying instruction can only be taught at a paragliding school recognized by the flying federation of your country. Nevertheless, we remind you that it is important that you carefully read all the contents of the manual for your new Fusion

The Fusion has been **certified as EN C**, having met all the requirements of EN 926-2 / 2013 and LTF NFL II 91/09.

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.



User's manual version V02.01 dated: 09/2021.

PILOT'S PROFILE

The Fusion was designed to be a performance orientated paraglider with safety in mind and is not a glider suitable to be used as a training glider.

Designed for pilots familiar with recovery techniques, who fly actively and regularly.

Designed to be an EN C certified glider, according to EN 926-2 it should only be flown by intermediate and advanced pilots.

As the name suggests, we have fused the technology learnt from our high performance 2-liners, the XCRacer and Spectra and combined them in an accessible package. The Fusion is a hybrid 3 to 2 liner where we used the best of both technologies in one glider. Fusion has its race pedigree on an obedient platform allowing increased levels of safety and glider control.

On cascade one and two we have a traditional 3 liner layout and on the outermost cascade, we have a 2-liner layout. To combine those 2 distinct line-layouts we designed a sophisticated yet simple to use risers.

Fusion's revolutionary riser setup brings the connection Pilot / glider to the C class, only experienced on 2-liners before. Fusion rear riser controls and steering is the same as a 2-liner.

The C toggles will help the pilot feel more connected to the glider while gliding at speed. Fusion risers allow the pilot to fly the glider while on bar, changing AoA rather than distorting the profile. The result is a more enjoyable and efficient exercise and less need to come off the bar to use the brakes in severe turbulence.

We opted to use a pitch stable air-foil translating to a much more enjoyable experience. Which gives to the package a glider which is less prone to collapses and oscillations, so the pilot is let to concentrate on what is more important, to read the conditions and fly with a freer mind.

The combination of all the design solution and technology results in a glider which is both a dream to fly but with an excellent level of true-performance of its class and it's a GAME CHANGER. Special attention was also given on the handling, especially the turn ability whilst circling in thermals. For us at Flow paragliders we are delighted by how the glider behaves and it is hands down one of the most pleasant gliders we've ever flown, simply a joy to fly.

SPECIFICATIONS

FUSION	S	M	ML	L
FLAT AREA	22.95 m2	24.45 m2	26.3 m2	28.4 m2
PROJECTED AREA	19.56m2	20.89m2	22.47m2	24.15m2
FLAT WINGSPAN	12.07m	12.48m	12.94m	13.50m
PROJECTED SPAN	9.73 m	10.06 m	10.43 m	10.89 m
ASPECT RATIO	6.35	6.35	6.35	6.35
PROJECTED AR	4.86	4.86	4.86	4.86
MAX CHORD	2.38	2.45	2.54	2.62
NUMBER OF CELLS	68	68	68	68
GLIDER WEIGHT	4.5kg	4.7kg	5.0kg	5.2kg
TAKE OFF WEIGHT	72-92	80-103	92-115	107-128
CERTIFICATION	LTF/EN C	LTF/EN C	LTF/EN C	LTF/EN C

TAKE-OFF, FLIGHT, AND FLYING TECHNIQUES

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

The Fusion 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 Fusion 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 Fusion 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 Fusion 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 Flow Fusion 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:* Due to the hybrid 3-2 line layout, B–line stall is not an efficient and stable descent manoeuvre on the Fusion, therefore not recommende.

- *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 Fusions best glide is at a trim speed (no brakes) – about 39 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 Fusion is equipped with a speed system. The profile of Fusion 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.

C Riser Steering – Wooden toggles

Fusion can be flown the same as a 2-liner. When gliding using the speed bar, the C toggles can be used to control the pitch to a more efficient glide. The C toggles can also be used to catch deflations and for directional control.

ASSYMETRIC & FRONTAL COLLAPSES

Despite the tests proving Fusion recovers on its own after collapses, it is a EN C 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 Fusion, 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 Fusion 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 Fusion 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 Fusion using the C-risers (rear riser). The movements must be well controlled as the deformation of the wing, due to the traction on the C-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
FUSION S	43cm	44cm
FUSION M	43cm	46cm
FUSION ML	43cm	46cm
FUSION 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 Flow Fusion 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.
- 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.

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 after 24 months, or after 100 hours. Whichever comes first. If anytime, however, there is a change in its behaviour your paraglider should be checked immediately. 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

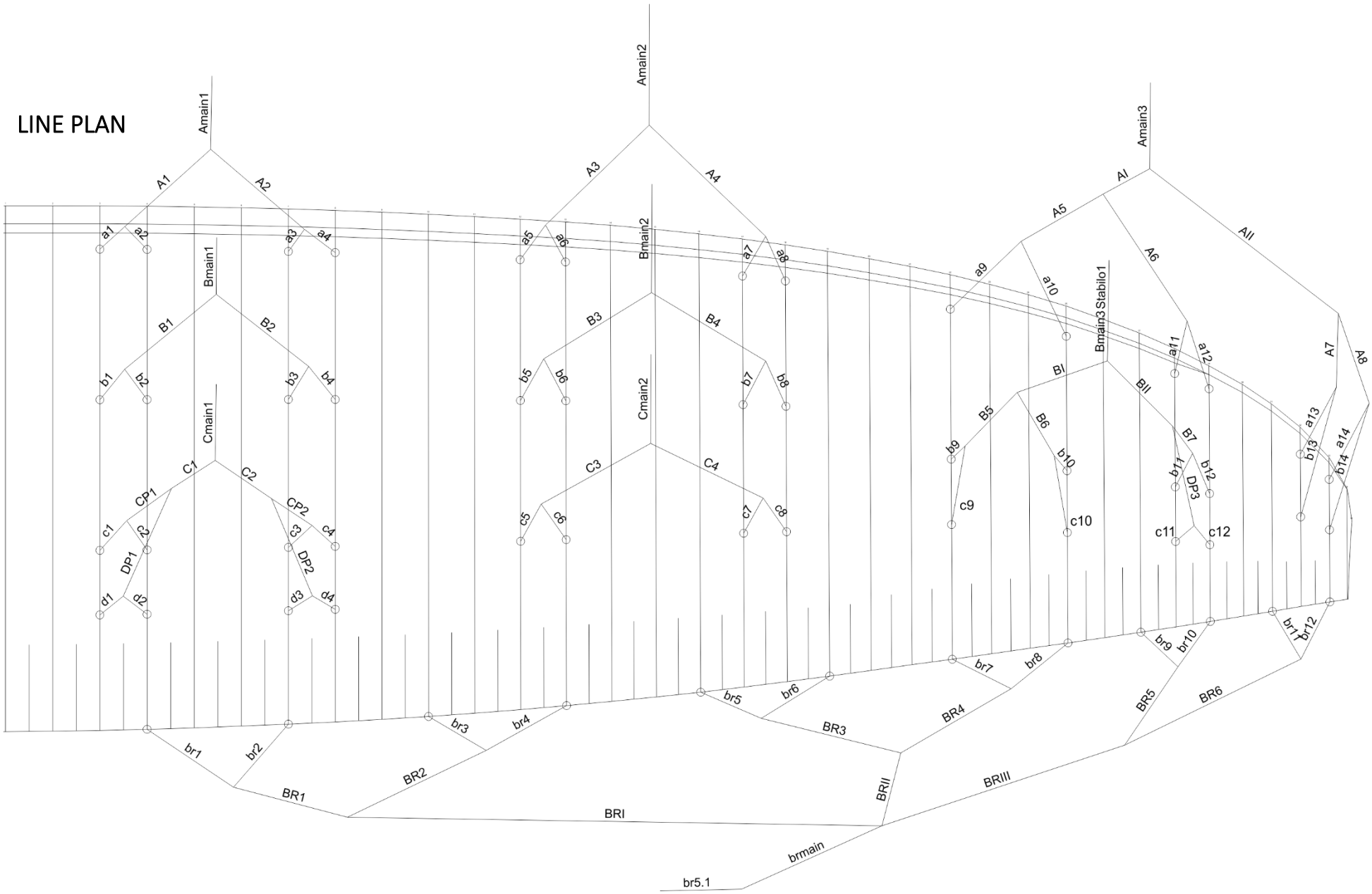
Flow paragliders' warranty covers any material defects or any production fault for two years or 250 hours since the date of purchase.
The guarantee does not cover:

- 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 your quik reactions and feel of the glider 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 local council.

LINE PLAN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Amain2
Amain3
A1
A2
A3
A4
AI
A5
AII
A6
A7
A8
a1
a2
a3
a4
a5
a6
a7
a8
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a10
a11
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a13
a14
Bmain1
Bmain2
Bmain3 Stabilo1
B1
B2
B3
B4
BI
B5
BII
B6
B7
b1
b2
b3
b4
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b6
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b10
b11
b12
b13
b14
Cmain1
Cmain2
C1
C2
C3
C4
CP1
CP2
DP1
DP2
DP3
c1
c2
c3
c4
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RISER DIAGRAM
Size S,M

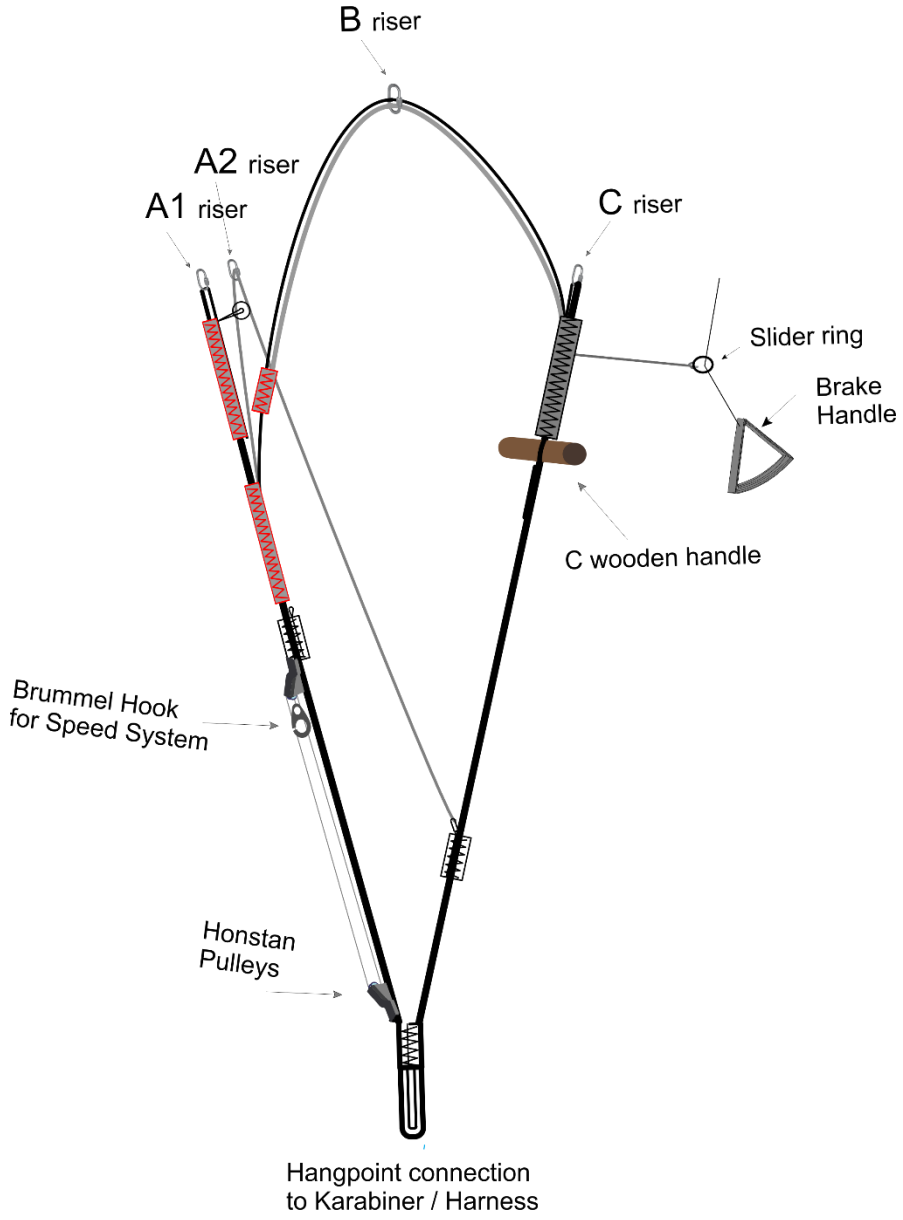
NON-ACCELERATED		*ACCELERATED*	
A	500mm	A	375mm
A1	495mm	A1	435mm
B	580mm	B	515mm
C	500mm	C	500mm

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

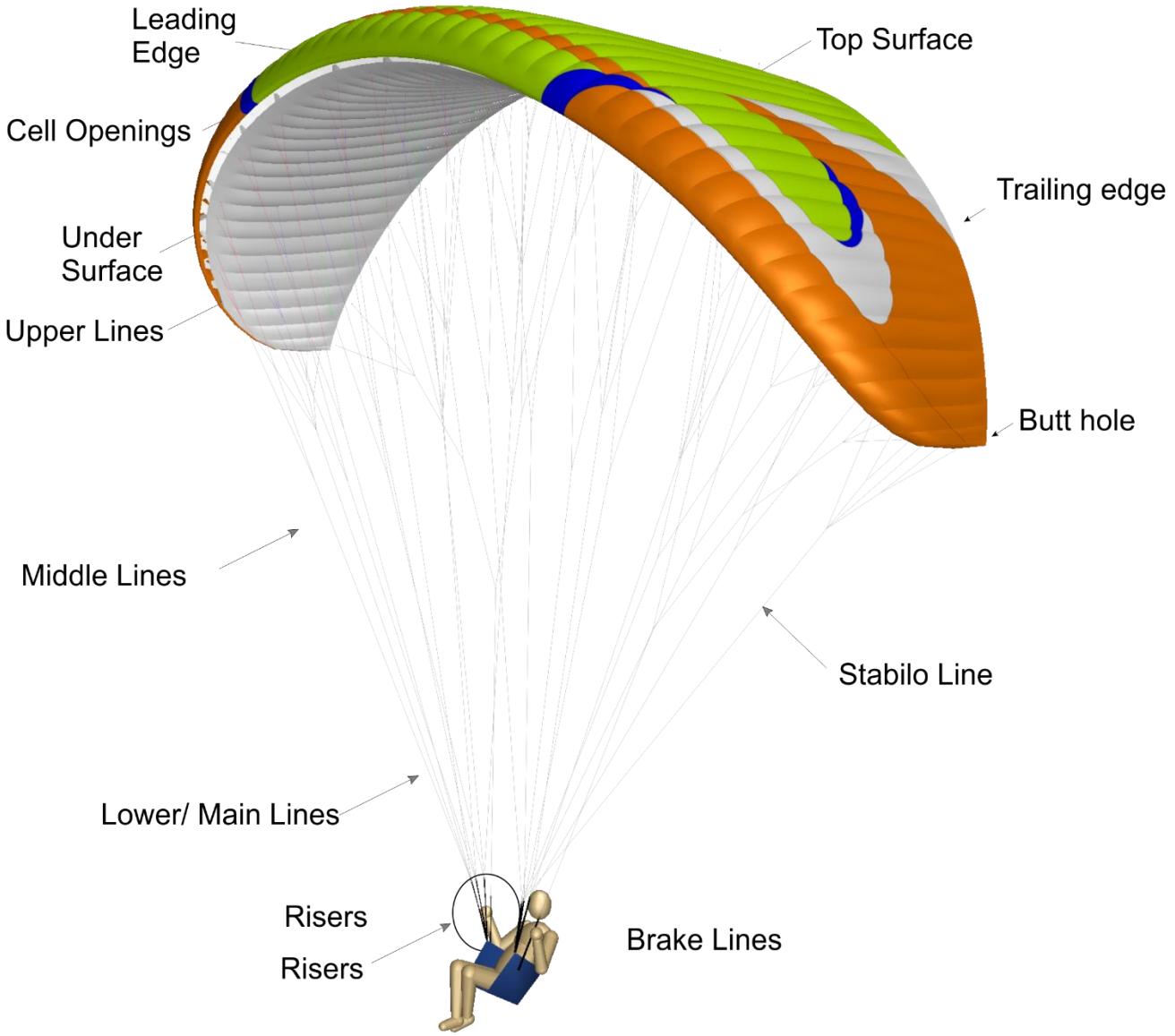
Size ML, L

NON-ACCELERATED		*ACCELERATED*	
A	500mm	A	365mm
A1	495mm	A1	430mm
B	580mm	B	510mm
C	500mm	C	500mm

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



OVERALL ILLUSTRATION



MATERIALS

CANOPY	FABRIC CODE	SUPPLIER
Upper surface	Porcher Skytex 32 soft	Porcher Industries - France
Bottom Surface	Porcher Skytex 32 soft	Porcher Industries - France
Supported Ribs	Porcher Skytex 32 hard	Porcher Industries - France
Unsupported Ribs	Porcher Skytex 32 hard	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 – 197 Crane Crescent, Nerang, 4211, Australia – info@flowparagliders.com.au

OVERALL LINE MEASUREMENTS

The overall length (riser lines + mid lines + upper lines) must be checked under 5Kgs (50 N) 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.

Measurements taken from the bottom of risers to canopy attachment point.

FUSION S, M, ML and L can be found in the "download" section of the Fusion's page.

LINE TYPE (for Fusion S,M, ML and L)

Name	Manufacturer	Name	Manufacturer	Name	Manufacturer	Name	Manufacturer	Name	Manufacturer
a1	8000U-90	**b1**	8000U-90	**c1**	8000U-50	**d1**	8000U-50	**br1**	8000U-50
a2	8000U-90	**b2**	8000U-90	**c2**	8000U-50	**d2**	8000U-50	**br2**	8000U-50
a3	8000U-90	**b3**	8000U-90	**c3**	8000U-50	**d3**	8000U-50	**br3**	8000U-50
a4	8000U-90	**b4**	8000U-90	**c4**	8000U-50	**d4**	8000U-50	**br4**	8000U-50
a5	8000U-90	**b5**	8000U-90	**c5**	8000U-50	**d5**	8000U-50	**br5**	8000U-50
a6	8000U-90	**b6**	8000U-90	**c6**	8000U-50	**d6**	8000U-50	**br6**	8000U-50
a7	8000U-90	**b7**	8000U-90	**c7**	8000U-50	**d7**	8000U-50	**br7**	8000U-50
a8	8000U-90	**b8**	8000U-90	**c8**	8000U-50	**d8**	8000U-50	**br8**	8000U-50
a9	8000U-90	**b9**	8000U-50					**br9**	8000U-50
a10	8000U-90	**b10**	8000U-50	**CP1**	8000U-90	**DP1**	8000U-50	**br10**	8000U-50
a11	8000U-50	**b11**	8000U-50	**CP2**	8000U-90	**DP2**	8000U-50	**br11**	8000U-50
a12	8000U-50	**b12**	8000U-50	**C1**	8000U-130	**DP3**	8000U-50	**br12**	8000U-50
a13	8000U-50	**b13**	8000U-50	**C2**	8000U-130				
a14	8000U-50	**b14**	8000U-50	**C3**	8000U-90			**BR1**	8000U-50
				C4	8000U-90			**BR2**	8000U-50
A1	8000U-230	**B1**	8000U-130					**BR3**	8000U-50
A2	8000U-230	**B2**	8000U-130	**Cmain1**	8000U-130			**BR4**	8000U-50
A3	8000U-130	**B3**	8000U-130	**Cmain2**	8000U-130			**BR5**	8000U-50
A4	8000U-130	**B4**	8000U-130					**BR6**	8000U-50
A5	8000U-70	**B5**	8000U-90						
A6	8000U-70	**B6**	8000U-90					**BRI**	8000U-50 R
A7	8000U-50	**B7**	8000U-70					**BRII**	8000U-50 R
A8	8000U-50							**BRIII**	8000U-50 R
		BI	8000U-130						
AI	8000U-130	**BII**	8000U-90					**brmain**	8000U-190
AII	8000U-130							**br5.1**	10-200
		Bmain1	8000U-360						
Amain1	8000U-360	**Bmain2**	8000U-190						
Amain2	8000U-360	**Bmain3**	8000U-130						
Amain3	8000U-190								