

Flow
PARAGLIDERS



SPECTRA

WELCOME

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.

The Flow Paragliders' Spectra is our CCC 2 liner designed for the ambitious pilot. The Spectra design bridges the gap between sophistication and simplicity where clever design solutions were adopted to minimise unnecessary complexity in paragliding design which usually leads to extra weight and drag. We concentrated in key areas and perfected those elements where performance was achieved without compromising safety. The Spectra has numerous hidden features that can be observed by the trained eye. The Spectra is a cohesive glider both in climb and glide and pilots who are accustomed to fly high performance gliders will feel comfortable and at ease to fly the Spectra to the maximum.



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General information

User manual for the Spectra

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 Spectra.

The Flow Spectra has been **certified as a CCC**, having met all the requirements of EN 926-1 strength tests and CIVL CCC Paragliders 2018 Revision 1.9.

This user manual version V02.06 is dated: 04/2019.





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.

This guide meets the requirements specified by EN 926-2:2005 as well as LTF NFL II 91/09 for user manuals.

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

PILOT'S PROFILE

The Spectra was built for the experienced competition pilots who are looking for a top-level performance glider in a comfortable and accessible package. Spectra's biggest quality is its stability while on bar. Other strengths worth mentioning are its superb glide, its excellent thermaling ability combined with its incredible top speed. The Spectra is a new glider concept.

Spectra is our CIVL Competition Class glider. Spectra's design bridges the gap between sophistication and simplicity where innovative and thoughtful design concepts were adopted to minimize complexity which usually leads to extra weight and drag.

We concentrated on key areas and perfected those elements for improved performance without compromising safety.

This has resulted in a glider which deforms less in turbulence, converts lift more efficiently, offers less distortion when AoA is changed, and has less parasitic drag.

With 176 leading edge cells and a reduced total line count the Spectra is the vanguard in glide performance and technology.

Spectra has numerous hidden features which can only be observed by the trained eye. Special attention was given to some key elements on the design, such as:

- leading edge structural integrity
- general internal spanwise and chordwise rigidity and tension
- relative alignment of the airflow in relation to the wingtips, reducing drag.

These hidden technologies combined offer true performance gains and usability.

Spanwise and chordwise tension and rigidity were reinforced to optimize handling and glider solidity.

Spectra is a cohesive glider both in climb and glide and pilots who are accustomed to flying high performance gliders will feel comfortable and at ease to fly the Spectra and push the glider to the maximum.

Even though the Spectra transmits a great deal of comfort in flight it is important to emphasise that a glider of this calibre should only be flown by pilots who have experience in flying high aspect ratio gliders, who are competent in the recovery techniques. For pilots who understand about active piloting and who are confident to fly in turbulent conditions and have an understanding of flying high performance 2 liners gliders.

Spectra is not suitable for beginner or intermediate pilots, aerobatics, training or tandem flights.



SPECIFICATIONS



	S	M	ML	LS	L	XL
FLAT AREA	20.35m ²	22.20m ²	23.80m ²	24.60m ²	25.88m ²	27.5m ²
PROJECTED AREA	17.34m ²	18.88m ²	20.24m ²	21.02m ²	21.98m ²	23.39m ²
FLAT WINGSPAN	12.37m	13.05m	13.49m	13.80m	14.18	14.52m
PROJECTED SPAN	10.08m	10.47m	10.84m	11.22m	11.45m	11.65m
ASPECT RATIO	7.65	7.65	7.65	7.65	7.65	7.65
PROJECTED AR	5.8	5.8	5.8	5.8	5.8	5.8
MAX CHORD	2.06	2.16	2.24	2.32	2.32	2.40
NUMBER OF CELLS	88	88	88	88	88	88
LINE CONSUMPTION	204.84m	216.92m	227.14m	230.20m	238.10m	249.86m
GLIDER WEIGHT	5.9	6.0	6.2	6.25	6.35	6.4
TAKE OFF WEIGHT	80-95	95-105	100-115	105-120	110-125	115-135
CERTIFICATION	CCC	CCC	CCC	CCC	CCC	CCC

TAKE-OFF, FLIGHT, AND FLYING TECHNIQUES

The Spectra 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 Spectra was designed as a foot launchable solo paraglider only. The Spectra may 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 risers are undamaged and tightened.
- Check that the risers are not damaged or twisted.
- Check if the speed system works freely and make sure 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, Spectra 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. Spectra 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

Spectra 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. 15% 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 5% brake). Symmetrical brake-input at 5-10 % 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:*** Spectra 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, brake pressure and the centrifugal force experienced, all progressively increase. 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:*** This manoeuvre is not possible on this glider. Traditional B-line stalls are not possible with 2 liners. Pulling the B-lines firmly will result in a full stall. Do not do it.

- **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

Spectra's 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.

Active B Riser Control

When gliding at trim speed or in accelerated flight, we recommend piloting the wing with the B-risers. This gives an improved feel and control over the wing enabling you to fly actively without using the brakes (which would cause drag and pitch movements). The direct feel allows you to stop collapses before they happen and maintain higher speeds and higher levels of efficiency.

Use of Speed Bar

Spectra is equipped with a speed system. The profile of Spectra 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 Spectra recovers on its own after collapses, it is a CCC 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 Spectra, 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 Spectra 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 Spectra 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 Spectra using the B-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 AND COLLAPSE LINES

The Spectra was certified with the use of collapse lines, therefore if you wish to induce collapses during SIV training, collapse lines must first be installed correctly. Collapse lines are available as an optional extra and should be added to the wing before inducing collapses. The collapse lines will come with an added-on instruction manual and an extra manual explaining how they should be installed properly. Be sure to attach to both sides of the canopy for symmetric deflations. Flow Paragliders would like to remind you that SIV manoeuvres should be learnt under the supervision of a qualified instructor and always used with caution. We strongly recommend expert tuition over water with all the necessary safety precautions in place. Only attempt SIV with this wing if you have previous SIV experience with a high aspect ratio wing. Ensure that you fully understand the correct and safe use of this equipment before attempting SIV

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
Spectra S	43cm	44cm

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 Spectra is sophisticated piece of equipment and 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), 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

Spectra 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

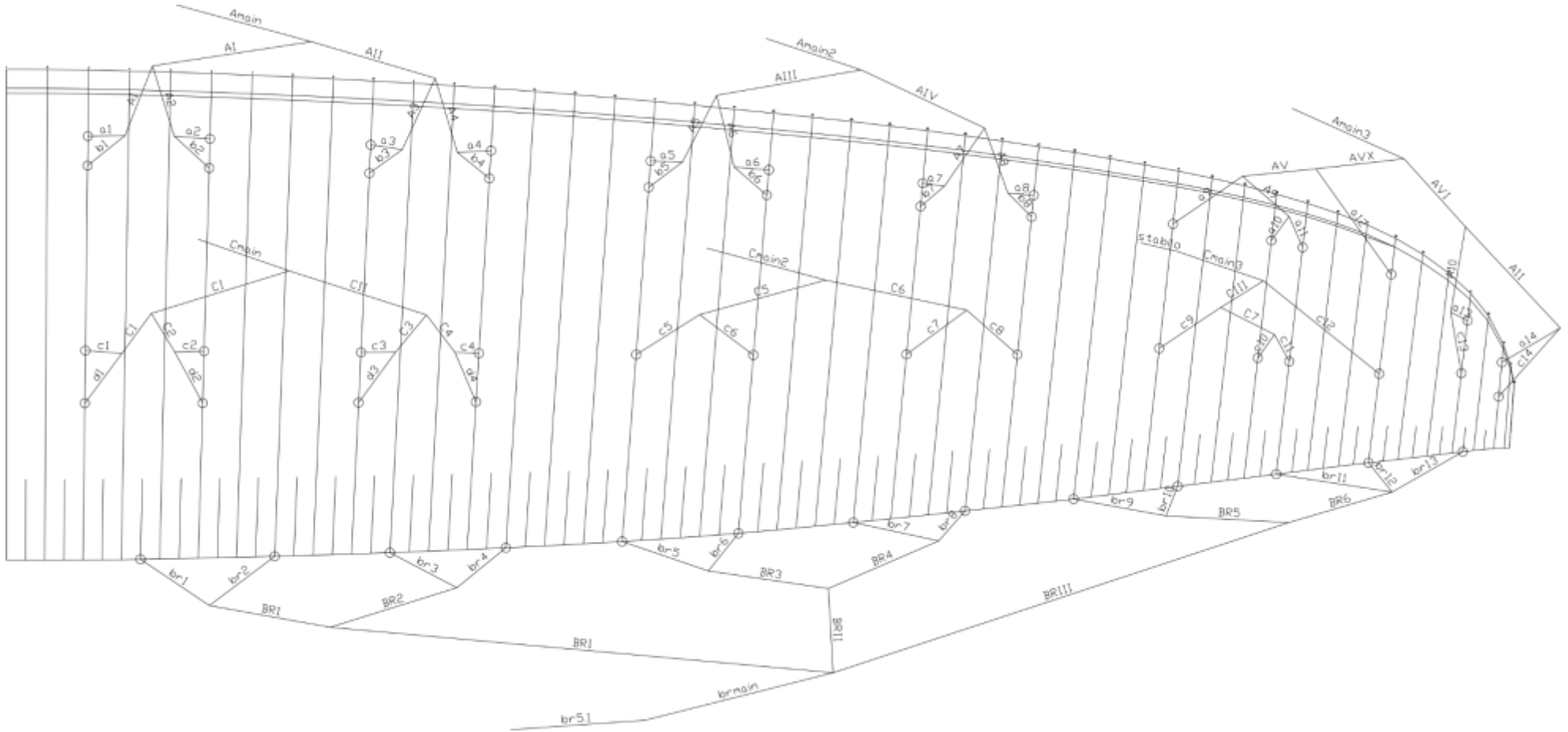
SUMMARY

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. Lot's 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

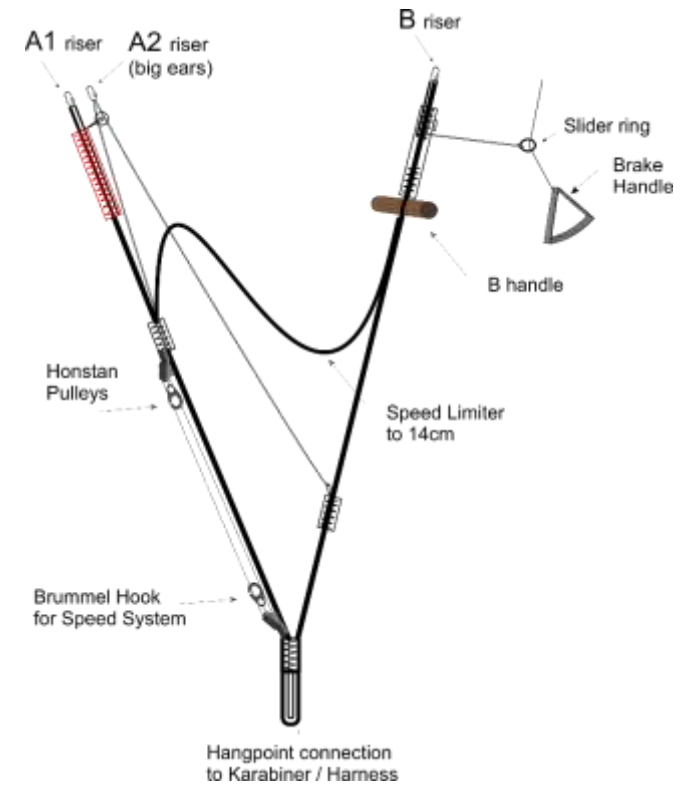


RISER DIAGRAM

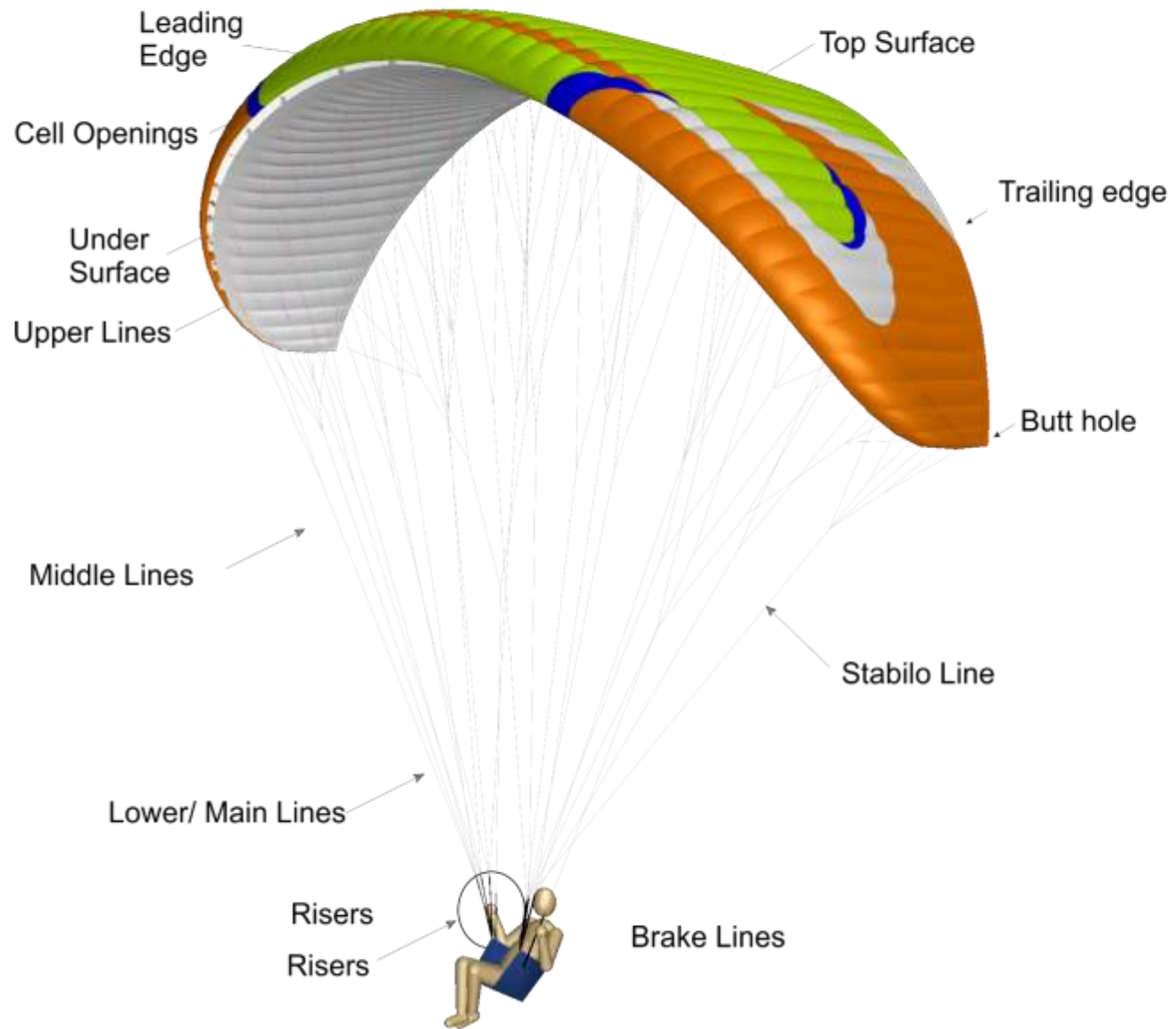
Spectra has been designed with 2 risers per side. The A1 riser is covered with RED webbing, to allow for easy identification. The A risers are split into two, the smaller riser - holding only the outermost A line - is A2 and has been designed this way to make applying big ears simple. They also feature ergonomic wooden handles for efficient B-riser control. The risers do not feature trimmers.

Sizes S, M, ML, L

Risers	trim	accel
A1	541	401
A2	538	468
B	525	525
Acc.	140	mm
Trimmer	n/a	mm



OVERALL ILLUSTRATION



MATERIALS



In case of any doubts regarding the information in the manual contact your FLOW PARAGLIDERS dealer.

CANOPY	FABRIC CODE	SUPLIER
Upper surface	Dominico DOKDO 30D MF/ Porcher SKYTEX 27 CLASSIC 2	Dominico terch Corp. – Korea Porcher Industries - France
Bottom Surface	Porcher SKYTEX 27 CLASSIC 2	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 – UV coated	Coats Thread - Thailand
SUSPENTION LINES	FABRIC CODE	SUPLIER
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 GMHB - Germany
RISERS	FABRIC CODE	SUPLIER
Shackles	Maillon Rapide	ANSUNG PRECISION - Korea
Riser Webbing	12mm zero stretch polyester webbing	Guth&Wolth GMBH - Germany
Pulleys	Pulleys Ronstan ball bearing	Ronstan - Australia

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 breaking strength report

Inspection certification number : **CCC_022.2018**
 Manufacturer name: **Flow Paragliders** kg daN
 Model name and size : **Spectra S** Maximum weight: **96** **93.1**
 Report valid for the other sizes of model : -

Line specification and line breaking strength in daN (strongest to weakest value) ⁽¹⁾

Line number	Manufacturer	Type no.	Breaking strength (daN)
1	Edelrid	8000U-980	298.1
2	Edelrid	8000U-190	185.1
3	Edelrid	8000U-130	87.4
4	Edelrid	8000U-090	85

Line number	Manufacturer	Type no.	Breaking strength (daN)
5	Edelrid	8000U-050	52
6	Edelrid	8000-030	33.5
7	Lima	PPSL160	275
8			

Line breaking strength, theoretical calculation (see details on the following pages) ⁽²⁾

	daN	g
Sum	2685.00	28.84
A+B+C+	2459.20	26.41
Stable lines	3358.00	36.05
Level 1	5209.20	55.95
Level 5	5361.20	57.48

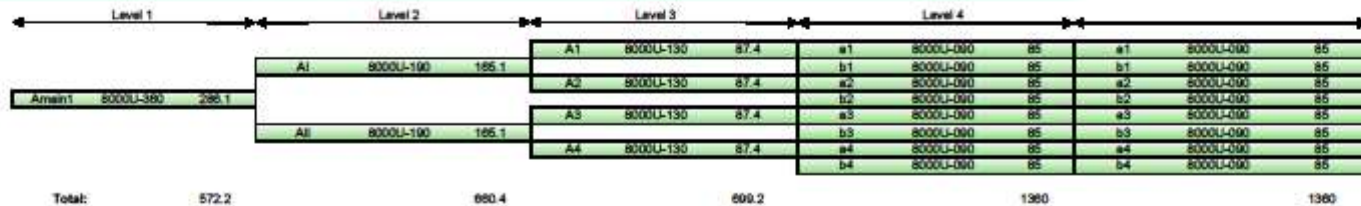
A, B and C, the sum of each level must be equal or exceed 2300daN or 23g

Result **POSITIVE**

Place of inspection: **Villeneuve**
 Date of issue: **21.02.2018**
 Inspector: **Alain Zoller**

CNL Competition Class (CCC)

Line junction and detailed line strength calculation



para-test.com

EN Certification
paragliders
materials
resorts

FAI Category 1 Cross-Country events
2016 Edition | Revision 1 | 01 Febr 2016

ACKNOWLEDGMENT of CONFORMITY

Air Turquoise SA,

Having thoroughly tested in flight and strength
following CCC regulations

Manufacturer: **Flow Paragliders PTY LTD**
Address: 1/24 Clyde Road
Dee Why 2099 NSW
Australia

Glider model: **Spectra S**
Evaluation Date: 12.01.2019

S/N: SPC1850120

Conformity number: CCC_022.2019
Place of test: Villeneuve
Classification: **FAI CCC**

Total weight in flight: maxi 95 kg

Delivery date: 21.02.2019

Alain Zoller
Director
Air Turquoise SA

para-test.com

paragliding by air turquoise

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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 +/- 20mm. The changes that could appear are a slight shrink on the B's and/or a slight stretch on the A's. The consequences of these changes can include a slower trim speed, difficult inflation etc.

BRIDLE CHECKSHEET LENGTHS (mm) Total line lengths with riser (mm)

		A	B	C	D	total brake line
Center	1	7540	7509	7351	7538	7883
	2	7432	7398	7252	7447	7763
	3	7385	7356	7217	7410	7633
	4	7435	7409	7260	7446	7608
	5	7351	7327	7321		7460
	6	7228	7202	7198		7316
	7	7154	7134	7139		7227
	8	7174	7156	7168		7240
	9	6969		6964		7088
	10	6850		6858		6976
	11	6833		6845		6919
	12	6765		6795		6925
	13	6681		6697		7008
Wing tip	14	6665		6702		

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

Name	Length	Line type	Weight value	Simulation weight (kg)
a1	251	8000U-90	1.1855	1.8309
a2	236	8000U-90	1.1643	1.6056
a3	215	8000U-90	1.1363	1.1283
a4	224	8000U-90	1.1028	1.7065
a5	237	8000U-90	1.0554	1.1969
a6	227	8000U-90	0.9843	1.3524
a7	228	8000U-90	0.89576	1.0684
a8	238	8000U-90	0.78759	1.5126
a9	1279	8000U-90	0.67351	1.011
a10	220	8000U-50	0.32908	1.798
a11	201	8000U-50	0.28663	0.74522
a12	1691	8000U-50	0.3435	1.0847
a13	494	9200-30	0.16938	0.59301
a14	400	9200-30	0.06085	0.10447
A1	1241	8000U-130	2.3709	4.516
A2	1140	8000U-130	2.3286	3.7478
A3	1141	8000U-130	2.2727	3.301
A4	1186	8000U-130	2.2057	3.9329
A5	1070	8000U-130	2.1109	3.6164
A6	950	8000U-90	1.9686	3.4614
A7	950	8000U-90	1.7915	2.893
A8	960	8000U-90	1.6797	2.9664

A9	940	8000U-90	0.61571	2.1947
A10	250	9200-30	0.33877	0.62597
A11	330	9200-30	0.1217	
AI	752	8000U-190	4.6995	8.0868
AII	729	8000U-190	4.4784	7.1537
AIII	829	8000U-190	4.0795	6.8165
AIV	765	8000U-190	3.4712	5.6541
AV	621	8000U-130	1.2892	2.9582
AVI	2650	8000U-50	0.46047	0.47824
AVX	1798	8000U-130	1.6327	3.7898
Amain1	4770	8000U-360	9.1779	14.701
Amain2	4700	8000U-360	7.5507	11.904
Amain3	2758	8000U-190	2.0932	4.0673
b1	217	8000U-90	1.1855	2.9255
b2	201	8000U-90	1.1643	2.3237
b3	181	8000U-90	1.1363	2.2694
b4	193	8000U-90	1.1028	2.3666
b5	209	8000U-90	1.0554	2.6696
b6	199	8000U-50	0.9843	2.3532
b7	202	8000U-50	0.89576	1.9906
b8	214	8000U-50	0.89212	1.6177
c1	508	8000U-90	1.1855	1.7462

c2	407	8000U-90	1.1643	1.7501
c3	416	8000U-90	1.1363	1.8545
c4	431	8000U-90	1.1028	1.5903
c5	1279	8000U-90	1.0554	2.2523
c6	1153	8000U-50	0.9843	1.9865
c7	1139	8000U-50	0.89576	1.8011
c8	1172	8000U-90	0.78759	1.4698
c9	1239	8000U-50	0.67351	1.7837
c10	212	8000U-50	0.32908	0.62114
c11	199	8000U-50	0.28663	0.57811
c12	1699	8000U-50	0.3435	0.57816
c13	511	9200-30	0.16938	0.20198
c14	436	9200-30	0.06085	
C1	842	8000U-90	1.1855	2.2922
C2	842	8000U-90	1.1643	2.1503
C3	870	8000U-90	1.1363	2.2293
C4	900	8000U-90	1.1028	2.0969
C5	920	8000U-50	0.61571	1.0756
CI	1069	8000U-130	2.3498	4.3447
CII	996	8000U-130	2.2392	4.2302
CIII	798	8000U-90	2.0397	4.1361
CIV	752	8000U-90	1.6833	3.2143
CV	638	8000U-130	1.2892	2.7208

Cmain1	4528	8000U-190	4.589	8.3083
Cmain2	4721	8000U-190	3.7231	7.065
Cmain3	3940	8000U-90	1.6327	3.1844
stabilo	615	ppsl 160	1.6327	3.1117
d1	579	8000U-50	1.1855	0.61978
d2	487	8000U-50	1.1643	0.46437
d3	492	8000U-50	1.1363	0.44285
d4	499	8000U-50	1.2574	0.57459
br1	826	9200-30	2.7031	0.35089
br2	700	9200-30	0.98474	0.17313
br3	737	9200-30	0.96499	0.15582

br4	710	9200-30	0.93833	0.077377
br5	737	9200-30	1.1904	0.48605
br6	600	9200-30	0.8294	0.15766
br7	677	9200-30	0.76106	0.31478
br8	694	9200-30	0.68305	0.23418
br9	769	9200-30	0.59821	0.26185
br10	657	9200-30	0.50892	0.17256
br11	803		0.41328	0.14804
br12	816	9200-30	0.30082	0.078548
br13	924	9200-30	0.13388	0.084919
BR1	1467	9200-30	3.6879	0.48436
BR2	1304	9200-30	1.9033	0.21199

BR3	1218	9200-30	2.0198	0.59143
BR4	1050	9200-30	1.4441	0.48988
BR5	1150	9200-30	1.1071	0.37982
BR6	951	9200-30	0.84798	0.26208
BRI	2821	8000U-50	5.5912	0.66345
BRII	2685	8000U-50	3.464	1.0196
BRIII	2355	8000U-50	1.9551	0.58881
brmain	1480	8000U-190	11.01	2.1259
br5.1	1115	10-200	11.01	2.1088

CANOPY MEASUREMENTS

Size S

	Rib nb from centre	measure	tension	tolerances
Full Span		12376	5daN	2%
½ Trailing edge		6188	5daN	1%
Chord A	01	2065	5daN	1%
Chord B	17	1769	5daN	1%

$\frac{4 * \textit{Span}}{\textit{Chord A} + (2.5 * \textit{Chord B})}$
$\frac{4 * 12376}{2065 + (2.5 * 1769)}$
7.65

		A	B	C	D	tot brake line
Center	1	7540	7509	7472	7538	7883
	2	7432	7398	7372	7447	7763
	3	7385	7356	7338	7410	7633
	4	7435	7409	7381	7446	7608
	5	7351	7327	7321		7460
	6	7228	7202	7198		7316
	7	7154	7134	7139		7227
	8	7174	7156	7168		7240
	9	6969		6964		7088
	10	6850		6858		6976
	11	6833		6845		6919
	12	6765		6795		6925
	13	6681		6697		7008
Wing tip	14	6665		6702		

Size M – [Scale ratio 1.09090](#)

	Rib nb from centre	measure	tension	tolerances
Full Span		13032	5daN	2%
½ Trailing edge		6525	5daN	1%
Chord A	01	2164	5daN	1%
Chord B	17	1872	5daN	1%

$\frac{4 * \textit{Span}}{\textit{Chord A} + (2.5 * \textit{Chord B})}$
$\frac{4 * 13032}{2164 + (2.5 * 1872)}$
7.65

		A	B	C	D	tot brake line
Center	1	7940	7916	7911	8004	8318
	2	7830	7801	7797	7912	8160
	3	7789	7760	7765	7871	8059
	4	7846	7819	7822	7921	8058
	5	7765	7741	7750		7901
	6	7635	7618	7623		7735
	7	7565	7549	7560		7657
	8	7585	7572	7591		7678
	9	7365		7386		7554
	10	7230		7264		7437
	11	7210		7249		7362
	12	7132		7180		7339
	13	7038		7075		7445
Wing tip	14	7025		7101		

Size ML – [Scale ratio 1.16953](#)

	Rib nb from centre	measure	tension	tolerances
Full Span		13493	5daN	2%
½ Trailing edge		6756	5daN	1%
Chord A	01	2241	5daN	1%
Chord B	17	1938	5daN	1%

$\frac{4 * \textit{Span}}{\textit{Chord A} + (2.5 * \textit{Chord B})}$
$\frac{4 * 13493}{2241 + (2.5 * 1872)}$
7.65

		A	B	C	D	tot brake line
Center	1	8232	8208	8198	8305	8722
	2	8121	8093	8095	8190	8483
	3	8079	8051	8052	8149	8390
	4	8132	8112	8111	8205	8387
	5	8055	8032	8037		8220
	6	7916	7895	7906		8055
	7	7858	7831	7843		7971
	8	7871	7856	7871		7989
	9	7642		7662		7856
	10	7505		7545		7736
	11	7482		7525		7665
	12	7401		7443		7626
	13	7306		7338		7739
Wing tip	14	7296		7365		

Size LS – [Scale ratio 1.25307](#)

	Rib nb from centre	measure	tension	tolerances
Full Span		13723	5daN	2%
½ Trailing edge		6871	5daN	1%
Chord A	01	2284	5daN	1%
Chord B	17	1965	5daN	1%

$\frac{4 * \textit{Span}}{\textit{Chord A} + (2.5 * \textit{Chord B})}$
$\frac{4 * 13967}{2317 + (2.5 * 2007)}$
7.65

		A	B	C	D	tot brake line
Center	1	8256	8232	8208	8301	8997
	2	8132	8106	8085	8183	8843
	3	8088	8064	8053	8149	8759
	4	8148	8127	8123	8212	8775
	5	8067	8051	8058		8615
	6	7934	7916	7922		8443
	7	7872	7855	7860		8370
	8	7898	7883	7894		8396
	9	7675		7675		8253
	10	7530		7555		8144
	11	7509		7535		8090
	12	7451		7488		8078
	13	7375		7406		8255
Wing tip	14	7372		7430		

Size L – [Scale ratio 1.25307](#)

	Rib nb from centre	measure	tension	tolerances
Full Span		13967	5daN	2%
½ Trailing edge		6993	5daN	1%
Chord A	01	2317	5daN	1%
Chord B	17	2007	5daN	1%

$\frac{4 * \textit{Span}}{\textit{Chord A} + (2.5 * \textit{Chord B})}$
$\frac{4 * 13967}{2317 + (2.5 * 2007)}$
7.65

		A	B	C	D	tot brake line
Center	1	8571	8542	8533	8655	8836
	2	8446	8418	8411	8542	8662
	3	8418	8377	8378	8499	8571
	4	8479	8442	8432	8542	8568
	5	8400	8368	8380		8390
	6	8262	8225	8246		8225
	7	8185	8158	8181		8135
	8	8198	8180	8209		8150
	9	7967		7981		8035
	10	7825		7856		7913
	11	7802		7836		7820
	12	7714		7759		7785
	13	7620		7661		7901
Wing tip	14	7610		7693		

Size XL – [Scale ratio 1.35135](#)

	Rib nb from centre	measure	tension	tolerances
Full Span		14504	5daN	2%
½ Trailing edge		7232	5daN	1%
Chord A	01	2409	5daN	1%
Chord B	17	2083	5daN	1%

$\frac{4 * \textit{Span}}{\textit{Chord A} + (2.5 * \textit{Chord B})}$
$\frac{4 * 14504}{2409 + (2.5 * 2083)}$
7.65

		A	B	C	D	tot brake line
Center	1	8847	8820	8816	8932	9290
	2	8727	8695	8685	8808	9117
	3	8679	8651	8650	8769	9026
	4	8747	8719	8725	8827	9018
	5	8663	8641	8645		8843
	6	8526	8501	8510		8659
	7	8443	8427	8445		8586
	8	8462	8453	8471		8590
	9	8224		8240		8454
	10	8079		8108		8322
	11	8053		8085		8226
	12	7966		8009		8187
	13	7860		7900		8283
Wing tip	14	7847		7937		