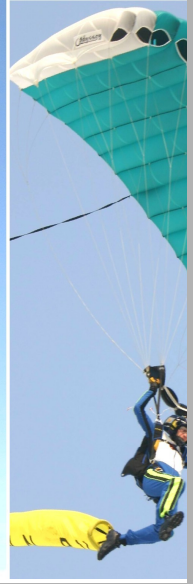
Skylark™

DESIGNING & MANUFACTURING OF PARACHUTE EQUIPMENT

WWW.SKYLARK.KIEV.UA



Owners Manual

skydiving canopies

TM «Skylark»

Ukraine 2005

WARNING

Because of the unavoidable danger associated with the use of parachutes, the manufacturer makes no warranty, either expressed or implied.
It is sold with all faults and without any warranty of fitness for any purpose.
The manufacturer also disclaims any liability in tort for damages, direct or consequential, including personal injuries resulting from a defect in design, material or workmanship or manufacturing or otherwise. By using this parachute assembly, or allowing it to be used by others, the user waives any manufacturer liability for personal injuries or other damages arising from such use.
If buyer declines to waive manufacturer liability, buyer may obtain a full purchase price refund by returning the parachute to our authorized dealer through whom the parachute was bought, before use within 30 days from original purchase date with a letter stating why it was returned.

Dear customer!

Thank you for choosing SKYLARK® Canopy!
Our young professional team is dedicated to equip you with the gear of highest quality and performance. We are confident you will like your new SKYLARK Canopy in all aspects of the sport
Regardless if you purchased new or used canopy, it shall be thoroughly inspected and attached to the system by authorized rigger.
proper care it will serve you for many years and bring you hundreds of joyful jumps!

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Skipper

Skipper is a modern 7-cell versatile ram-air canopy.

In designing Skipper we applied unique technical solutions for this class.
Special design of air intakes reduces deformation of the skin. Performance is close to that of 9-cell canopies with high aspect ratio. Due to this we have managed to keep the advantages of 7-cell canopies, namely reliability, stability, low packing volume and the flight performance characteristics close to the 9-cell canopies.

With wing loadings of 1.3 or below Skipper can be recommended for beginners. At higher loadings it becomes notably more responsive on the toggles, but stays docile enough for a skydiver of average skills. Skipper gives consistently stable and comfortable openings, sought by cameramen and wingsuit pilots.

Recommended wing loading range of Skipper is 1.1 – 1.7 lb/sq.ft. Wing loading for the best flight performance lies in the range of 1.3 – 1.5 lb/sq.ft.

Skipper is produced of ZP fabric in the following sizes 110, 120, 130, 140, 150, 160, 170 and 190 sq.ft. The canopy is equipped with Vectran lines, manufacturer preset control lines, collapsible slider with stainless grommets and comes with the set of soft links.

We recommend to use our canopies only with kill-line pilot chute, made of ZP fabric and no more than 700mm in diameter. Recommended riser length is 500 mm. Recommended packing is ProPack.

Magellan is a modern semi-elliptical 9-cell ram-air canopy of popular intermediate class. Recommended for the pilots with average skill level.

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Due to the technological innovations applied in its design, Magellan is consistently stable and predictable! Comfortable openings, soft and easily mastered steering, good gliding performance, easy on front risers, stable and easy performing flare, good swoop performance make Magellan your reliable fun partner in day-to-day skydiving activities.

Loaded up to 1.2 lb/sq.ft. Magellan offers smooth steering and low descent rate, which makes it easy to handle even for beginners.

Recommended wing loading range is 0.95 – 1.85 lb/sq.ft. Wing loading for the best flight performance lies in the range of 1.2 – 1.6 lb/sq.ft.

Magellan is produced from ZP fabric in the following sizes: 100, 110, 120, 130, 140, 150, 160, 170 and 190 sq.ft. The canopy is equipped with Vectran lines, collapsible slider with stainless grommets and comes with the set of soft links.

We recommend to use our canopies only with kill-line pilot chute, made of ZP fabric and no more than 700mm in diameter. Recommended riser length is 500 mm. Recommended packing is ProPack

Odyssey is a modern, high performance, fully elliptical 9-cell ram-air canopy. Recommended only for experienced skydivers!

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Sharp and precise response to toggle inputs, with minimum altitude loss, high glide ratio, easy on front and responsive on the back risers, large recovery arch, good acceleration performance, powerful and stable flare - all these features, along with comfortable and stable deployments make Odyssey an ultimate tool to reveal your extreme potential!

Odyssey was born for Swoop and all related activities. There are a number of innovative solutions implemented: special airfoil and wing geometry, unique new type of air intake that reduces skin deformations and increases flight performance, swoop-optimized controls etc.

Remarkable flight performance of Odyssey allows using it effectively for another exciting discipline – Ground Launch!

Recommended wing loadings are in the range of 1.3 – 2.0 lb/sq.ft. Wing loading range for the best flight performance is 1.5 – 1.8 lb/sq.ft.

Odyssey is produced from ZP fabric in the following sizes: 90, 95, 100, 105, 110, 115, 120, 130, 140, 150 sq.ft. The canopy is equipped with Vectran lines, collapsible slider with stainless grommets, and comes with the set of soft links.

We recommend to use our canopies only with kill-line pilot chute, made of ZP fabric and no more than 700mm in diameter. Recommended riser length is 500 mm. Recommended packing is ProPack.

TECHNICAL DATA AND LIMITATIONS

In this manual we provide the following calculated technical data of SKYLARK® canopies:

- area of the canopy in sq.ft. calculated at the lower surface
- approximate packing volume in cu.in., when the canopy is packed using ProPack
- weight of the canopy in lbs (kg)
- minimum recommended exit weight* in lbs (kg)
- maximum recommended exit weight* in lbs (kg)
- geometric aspect ratio
- trim glide speed** with brakes released and with medium recommended exit weight , km/h
- trim descend rate with brakes released and medium recommended exit weight , m/s

* Exit weight – total weight of pilot, his outfit and rig
** Speeds are calculated at see level

1. Technical data of “SKIPPER”

Model-area sq.ft.	Pack vol. cu.in.	Weight lbs (kg)	Min. exit weight lbs(kg)	Max. exit weight lbs(kg)	Aspect ratio	Trim speed km/h	Descend rate m/s
SK-110	289	6 (3)	121 (55)	187 (85)	2,4	55	5,5
SK-120	304	6 (3)	132 (60)	204 (93)	2,4	55	5,5
SK-130	320	7 (3)	143 (65)	221 (100)	2,4	55	5,4
SK-140	336	7 (3)	154 (70)	238 (108)	2,4	55	5,4
SK-150	351	7 (3)	165 (75)	255 (116)	2,4	55	5,4
SK-160	367	7 (3)	176 (80)	272 (123)	2,4	55	5,3

SK-170	382	8 (4)	187 (85)	289 (131)	2,4	55	5,3
SK-190	414	8 (4)	209 (95)	300 (136)	2,4	55	5,2

2. Technical data of “MAGELLAN”

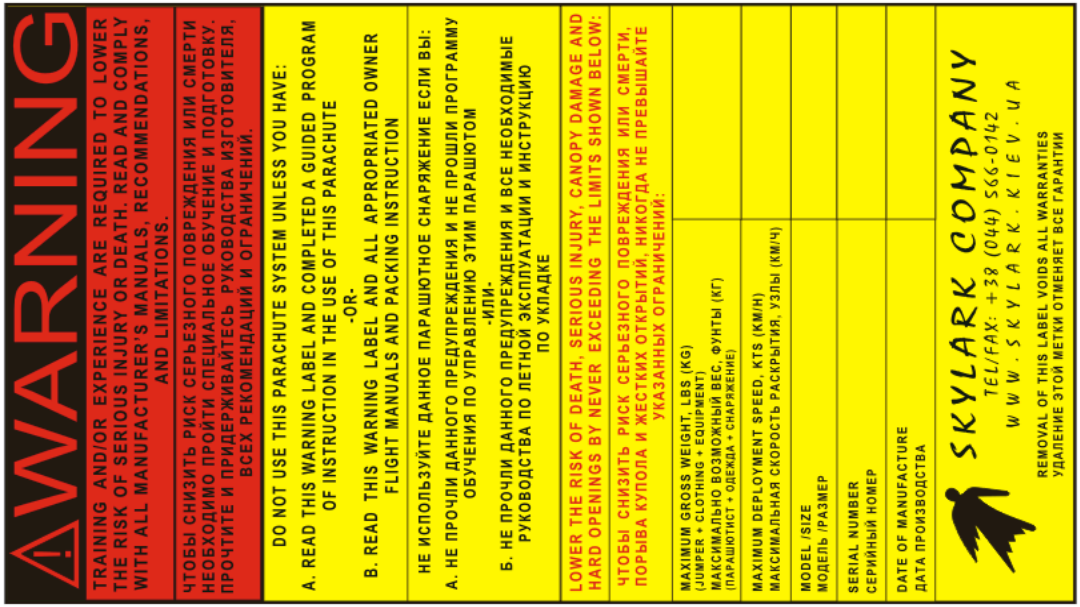
Model-area sq.ft.	Pack vol. cu.in.	Weight lbs (kg)	Min. exit weight lbs(kg)	Max. exit weight lbs(kg)	Aspect ratio	Trim speed km/h	Descend rate m/s
MA-110	303	6 (3)	105 (47)	204 (92)	2,58	53	4,9
MA-120	324	7 (3)	114 (52)	222 (101)	2,58	53	4,9
MA-130	345	7 (3)	124 (56)	241 (109)	2,58	53	4,9
MA-140	366	7 (3)	133 (60)	259 (117)	2,58	53	4,9

MA-150	387	8 (3)	143 (65)	278 (126)	2,58	53	4,8
MA-160	408	8 (4)	152 (69)	296 (134)	2,58	53	4,8
MA-170	429	8 (4)	162 (73)	300 (136)	2,58	54	4,8

3. Technical data of “ODYSSEY”

Model-area sq.ft.	Pack vol. cu.in.	Weight lbs (kg)	Min. exit weight lbs(kg)	Max. exit weight lbs(kg)	Aspect ratio	Trim speed km/h	Descend rate m/s
OD-90	261	5 (2)	117 (53)	180 (82)	2,7	58	5,5
OD-100	282	6 (3)	130 (59)	200 (91)	2,7	58	5,4
OD-110	303	6 (3)	143 (65)	220 (100)	2,7	58	5,4
OD-120	324	6 (3)	156 (71)	240 (109)	2,7	58	5,3
OD-130	345	7 (3)	169 (77)	260 (118)	2,7	58	5,2

Each Skylark® Canopy has the operating limitations of the maximum exit weight and the maximum deployment speed indicated on the warning label attached to the top central upper panel of the canopy:



2. OPERATION

ASSEMBLY

The canopy shall be inspected, set up and attached to the system by the certified rigger.

Before attaching the canopy to your system, inspect the canopy, lines and connection links. Make sure, that particular canopy can be used with the given container and deployment system.

Recommended assembly sequence:

1. Lay down container with the risers face-up next to the canopy. Position the Canopy with the bottom skin – up, facing with its leading edge the container.
2. Bring the pack of lines to the container and spread the lines straight with the steering lines on top.
3. Fix each group of lines to the respective riser with the rapid-link or soft link (with the new canopy – consequently releasing the connectors from the line holder). Don't tight the connectors up at this moment.
4. Ensure the correct installation of the slider – the reinforcement tape should be facing the canopy and pull tabs should be facing the trailing edge of the canopy.
5. Spread the steering lines so that they pass directly from the trailing edge of the canopy through the slider grommets and guiding rings of the back risers without crossing the other lines.

6. Connect the toggles to the steering lines (please refer to the manufacturer's manual of your container).
7. Recheck the order of lines connection and the orientation of the canopy. Make sure that after the opening canopy will fly forward! Fix errors if any.
8. Tight up the soft links* and fix them inside the risers to the special tapes with the thread (or tight up the rapid-links with help of the wrench and cover them with protective slider bumpers.)

* Soft links setup (shipped with the Skylark® canopies):

Make the first loop, letting the end of the soft link through the riser and then through the respective lines group.

A. Make the second loop in the same order
B. Let the end of the soft link under its restrictive tab and then put it on its top.
C. Rotate the soft link to hide its tab inside the riser.

PACKING

Before packing your canopy, thoroughly inspect upper and lower surface, ribs, seams on the skin and on the lines, inspect lines, slider and grommets. In case you detect any damage – i.e. tears, burns, worn-out, rusty or incorrectly assembled parts, please do the necessary maintenance on the canopy first.

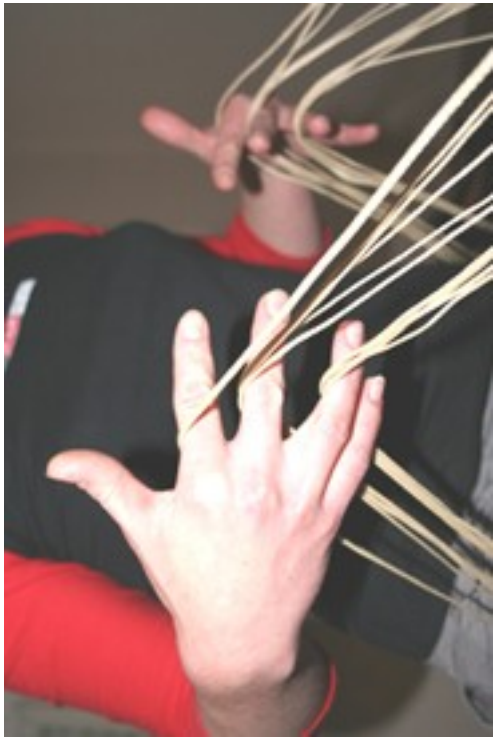
Packing with the ProPack:

1. Stretch the rig on the flat, level surface and fix the container from the movement

2. Set the deployment brakes according to the instructions of your container's manufacturer
3. Check that slider is not collapsed and pull tubs are hidden and not entangled with the lines (pic. 1)
4. Take lines where they are attached to the risers and divide them by the groups (control lines, rear risers group, front risers group). Walk to the canopy while letting the lines slide between your fingers (pic. 2)
5. Put the canopy on your shoulder so that it freely hangs and keeps the lines tense (move the slider behind your back at this time)
6. Straighten and flake 7 (or 9) air intakes (pic. 3)
7. Holding tightly the bundle, shake it well in order to straighten the folds (pic. 4)
8. Turn the canopy tail-away and grasp the air intakes between your knees (be cautious not to rotate the canopy full turn)
9. Separate the groups of lines AB, BC and CD on one side of the canopy and straighten fabric between them (pic. 5 and 6)
10. Repeat the step 9 with the other part of the canopy (pic. 7)
11. Straighten the slider between 4 groups of lines and move the grommets tightly to the slider stops (pic. 8)
12. Separate the control lines, straighten the fabric between them and turn them towards the center of the canopy under the slider (pic. 9 and 10)
13. Take the trailing edge of the canopy in your hand at central part (where the warning label is attached) and put it on the lines right below the slider, press it hard along with the lines and the slider (pic. 11)
14. Straighten the tail to the sides and coat with it the canopy towards the nose so that the control lines stay at the center of the canopy (pic. 12)

15. While holding the lines and the slider tight, connect the ends of the trailing edge and roll the tail. Be cautious not to capture into the roll the other parts of the canopy left inside. (pic. 13 and 14)
16. Keep an eye on the slider position and lines tense, slightly swing the bundle, lay it down on the floor and carefully squeeze the air out (pic. 15)
17. Make an S-fold of the required size and push it into the deployment bag.
18. Close the deployment bag and stow the lines, leaving 60 – 70 cm unstowed to prevent line twists (pic. 18)

Pict 1



Pict 2

Pict 3

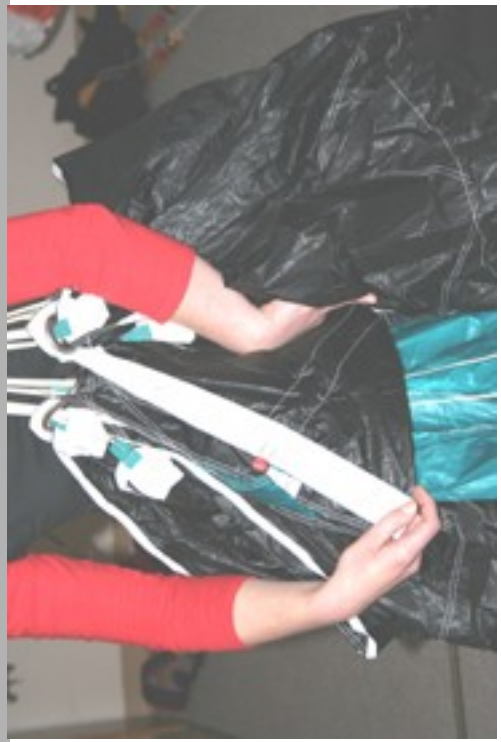
Pict 4

Pict 5

Pict 6

Pict 7

Pict 8



Pict 9

Pict 10

Pict 11

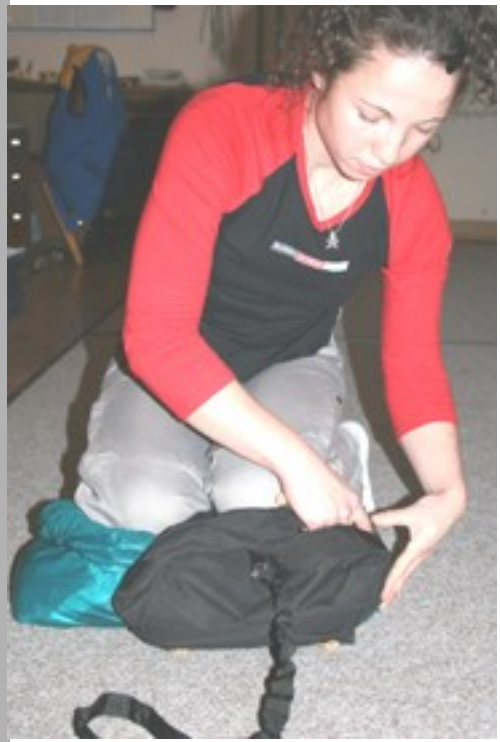
Pict 12

Pict 13

Pict 14

Pict 15

Pict 16



Pict 17

Pict 18

FLYING the canopy

Before deployment, it is recommended to reduce the horizontal speed in a freefall. During the deployment sequence, in order to equalize the load of the canopy and also to prevent line twists keep shoulders level and legs symmetric.

If after deployment you notice the beginning of the twist, do not release the brakes, but try to eliminate the problem. It is necessary to recognize possible direction of canopy rotation and compensate it with the gentle input of the rear riser.

In some cases, especially with higher loadings or when rotating on your back, you can find it extremely difficult to fight the rotation. In such cases brake away without hesitation as rotating canopy looses altitude very fast!

After deployment, be ready to turn away from other skydivers using rear risers or toggles. When the air is clear of obstacles, take a look at your canopy and your position relatively to the landing spot. Prepare to the landing in advance. Fly the canopy so that you can make a final turn into the wind at sufficient and safe altitude.

Making familiarization jumps with the new canopy, check stall behavior of the canopy on the safe altitude. Note the brakes position at the stall. This information will help you to make ideal flare when landing.

During landing, flare symmetrically and so that lift of the canopy achieves it’s maximum at the point of touch down. This will also reduce the horizontal speed.

Avoid low turns! Turns increase rate of descent and horizontal speed. If you turn low, you may not have sufficient altitude to straighten the flight path before touching the ground.

Please remember that stable descent and good flare are a lot more important than landing into the wind. If you are not sure that you have sufficient altitude to turn into the wind, land down wind, make good flare and be ready to run!

3. **STORAGE AND MAINTENANCE**

STORAGE

Fabric and other materials, used in the canopy construction are very sensitive to the environmental influence, especially to the UV rays. It is recommenced to use big bag or other cover material to protect the canopy from the direct sunlight on the ground.

When the canopy is not used, it should be stored in a dark dry place with the temperature 15-30°C and 15-70% of humidity.

Canopy should also be kept away from:
- high temperatures
- acids and other chemically aggressive agents
- pests
- chloral
- smoke

TECHNICAL MAINTENANCE

Repair and maintenance of the canopy should be done only by the manufacturer or experienced rigger.

Maintenance of the main canopy consists of the periodical inspection, line change, and timely repair of detected damages. If you have detected damages or anything suspicious, please contact your dealer or rigger before making the next jump.

Recommended control frequency is once in 3 months or 50 jumps, whatever comes first. If canopy is not stored properly it should be inspected more often.

During the inspection pay attention to the following:

1. Visually check the canopy for damages or defects of fabric, tapes and seams. Any burn or tear should be patched (use of self-adhesive fabric is not acceptable). Large damages, requiring replacement of entire part of design shall be fixed only by manufacturer.
2. Check if all Slider Stops are in place and their pockets are not damaged. There are four of them – for each group of lines.
3. Check tapes on the canopy, where the lines are attached and respective seams.
4. Check order of the main and control lines and ensure that all connection points are stitched. If lines are worn-out or have torn threads shall be replaced. Depending on the general condition of the lines the whole lines set replacement may be required. Normally lines should be replaced 1 – 2 times during the service life of the canopy. The main control lines are normally replaced more often.

5. Check the condition of the connectors. Ensure they are tightened well. In case of soft links – ensure their integrity.
6. Ensure the slider is correctly installed (reinforcement tape facing the canopy, pull-tabs towards trailing edge). Check the inner surface of the grommets for the notches, sharp edges or rust. Check condition of the slider fabric and reinforcement tapes.
7. Check the condition of the container following the instructions of manufacturer. Ensure integrity of all the seams, check conditions of the metal parts for damages and rust.
8. Inspect deployment chute, bridle and deployment bag. Check connection of the bridle to the canopy and to the deployment bag.
9. Follow the manufacturer's manual for your container to correctly connect the toggles to the control lines.
10. To minimize the wear of your gear do not pack the canopy on asphalt or concrete. Perform packing job only on the special packing matt.

4. RECOMMENDATIONS

LEARNING

This manual is not intended to be used as training manual. SKYLARK® Company by no means can confirm that your skills level is sufficient to operate selected SKYLARK® canopy.

Unlike the simple round parachutes, RAM-Air canopies represent really high speed aircraft and can not be flown safely unless pilot deeply understands design and principles of flight and possess flying skill at necessary level.

Before the first use of your new gear you should definitely go through the required training and pass the skill/knowledge test. In addition, you need to read not only this manual, but also all the necessary documentation and instructions as to flying and packing the canopy.

THE RIGHT CONTAINER

SKYLARK Canopies shall be used explicitly as main canopy along with the compatible container!

You can install our canopy in any container of appropriate size. Pack volumes are listed in the manual, but keep in mind, that the right container shall comply with the following, commonly recognized requirements:

A. Harness and risers shall be absolutely symmetrical. Front and back risers shall be

of the same length when strained. Overall asymmetry of the strained system shall not exceed 2.5mm

A. **B. The normal position for the control line guide ring is on the back side of the rear risers; the top of the control ring should be located 4" (1/16) from the canopy end of the riser. Risers using Velcro to hold the control toggles in place should use the hook Velcro on the riser and the loop Velcro on the toggle; the hook Velcro should be 1" x 5" and should start 1" below the bottom of the guide ring, centered under the ring. Risers shall have standard length**

THE RIGHT CANOPY

We strongly recommend consulting your instructor or experienced rigger who knows your skill level as well as your abilities.

In order to select the correct canopy size, it is important to understand some of the principles of flight.
First - flight performance and behaviour of the canopy vary with different wing loadings. With the reduction of the area all of the speed parameters increase: horizontal speed, rate of descend and, what is most important - the rate of rotation in turns, which is proportional to the square of speed. The canopy becomes less forgiving and more demanding to the pilot's experience and skills level.

Second – there are could be several sizes that would pass to your suspended weight. Please select the size, for which your suspended weight doesn't reach marginal values (min. or max.). Canopies of area greater then recommended may become sluggish and tend to instability. Canopy with area smaller than recommended will fly very fast and exciting, but it will also loose altitude much faster as well as it's service life will be shorter due to very high residual deformations of fabric.

Third - it is very important to understand how the steering lines being set up. The length of steering lines can be set longer and shorter than "theoretical" length. Shorter lines are normally set for the beginners and on the canopies of the greater area. Lines are normally set longer on the generic - non-diagonal canopies to increase it's swoop performance.

Recommended wing loadings for SKYLARK® canopies are listed in the description for each model. The correct size can be calculated with the following:

In order to find the wing loading, divide your exit* weight (in lbs) to the area of the selected canopy in sq.ft
In order to find the area of the selected canopy, divide your exit* weight (in lbs) to the wing loading

*exit weight – your weight, weight of your skydiving clothing and outfit (1kg = 2.2 lbs)

You can also use the table below to help you with the size selection:

Suspended weight (kg)	Recommened wing loading										
	1,0	1,1	1,2	1,3	1,4	1,5	1,6	1,7	1,8	1,9	2,0
230 (104)	230	209	192	177	164	153	144	135	128	121	115
220 (100)	220	200	183	169	157	147	138	129	122	116	110
210 (95)	210	191	175	162	150	140	131	124	117	111	105
200 (91)	200	182	167	154	143	133	125	118	111	105	100
190 (86)	190	173	158	146	136	127	119	112	106	100	95
180 (82)	180	164	150	138	129	120	113	106	100	95	90
170 (77)	170	155	142	131	121	113	106	100	94	89	85
160 (73)	160	145	133	123	114	107	100	94	89	84	80
150 (68)	150	136	125	115	107	100	94	88	83	79	75
140 (64)	140	127	117	108	100	93	88	82	78	74	70
130 (59)	130	118	108	100	93	87	81	76	72	68	65

5. Warranties

Skydiving is a high risk activity. If you have made the decision to go for it, nothing will eliminate the risk of injuries or death. Your participation in the sport confirms that regardless of your skill / knowledge level as well as your experience, regardless of the equipment in use you take personal responsibility for potential injuries or death.

Based on the above, SKYLARK® does not give any warranties related to the use of the SKYLARK® Parachutes. While using your canopy or giving it to somebody else for use, the owner acknowledges that no claims can be made towards SKYLARK® for the damages or other harm.