



**Pilots Manual**



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## WARNING

- Paragliding is a potentially dangerous sport that can cause serious injury including bodily harm, paralysis and death. Using Ozone equipment is undertaken with the full knowledge that paragliding involves such risks.
- As the owner of an Ozone emergency rescue parachute you take exclusive responsibility for all risks associated with its use. Inappropriate use and or abuse of your equipment will increase these risks. Any liability claims resulting from use of this product towards the manufacturer, distributor or dealers is excluded.
- This parachute has been solely designed for use as an emergency rescue system for paragliders. Do not under any circumstances use this parachute for free fall parachuting, BASE jumping or with any other type of aircraft.
- The Angel SQ is not suitable for speeds in excess of 32m/s or 115 kmh.
- Any unauthorized use is prohibited.
- Ensure your parachute is maintained properly and is regularly re-packed, failure to do so may result in premature ageing and slower opening times.
- Complete a thorough daily and pre-flight inspection of all of your equipment. Pay attention to your parachute pins and never attempt flying with unsuitable or damaged equipment.
- Do not allow the parachute to become damp; this can affect the opening times and overall performance and degrade the materials faster.
- Do not modify this product in any way and use only within the maximum certified weight.
- Always fly wearing a helmet, gloves and boots.
- It is essential that the Angel SQ is correctly installed to the harness. A compatibility test must be carried out by a qualified professional to exclude any possible non-compatibility between the harness and rescue device.
- Make sure that you are physically and mentally healthy before flying.
- Choose the correct wing, harness and conditions for your level of experience.
- Pay special attention to the terrain you will be flying and the weather conditions before you launch. Always add a large safety margin to all your decisions, if you are unsure do not fly. Avoid flying in rain, snow, strong wind, and turbulent weather conditions or clouds.
- If you use good, safe judgement you will enjoy many years of paragliding and hopefully never have need to use your Angel SQ parachute.

Remember, PLEASURE is the reason for our sport!

## THANK YOU

Thank you for choosing Ozone.

As a team of free flying enthusiasts, competitors and adventurers, our mission is to produce paragliding equipment of the highest quality using cutting edge designs and the best technical materials available.

The Angel SQ is a square emergency parachute designed for very fast opening times with a stable, slow decent rate. When it comes to emergency parachutes, fast opening times, excellent pendulum stability and low sink rate performance are the necessary ingredients for safe landings in emergency situations. The Angel SQ is effective in minimum height/low energy situations, both of which are common in paragliding.

Our development team is based in the south of France. This area, which includes the sites of Gourdon, Monaco and Col de Bleyne, guarantees us more than 300 flyable days per year. This is a great asset in the development of the Ozone range. We know that quality and value for money are essential considerations when choosing equipment, so to keep costs low and quality high we build all our products in our own production facility. During production all Ozone products undergo numerous rigorous quality control checks. This way we can guarantee that our equipment meets the same high standards that we expect ourselves.

This manual will show you how to maintain, throw and repack your Angel SQ parachute. If you need any further information about Ozone, the Angel SQ, or any of our products please check [www.flyozone.com](http://www.flyozone.com) or contact your local dealer, school or any of us here at Ozone.

Despite the Angel SQ's excellent pedigree, we certainly hope you will never have to use it!

Safe Flying.  
Team Ozone

## TEAM OZONE

Everyone at Ozone continues to be driven by our passion for flying, our love of adventure and our quest to see Ozone's paraglider development create better, safer and more versatile paragliders.

The design team consists of David Dagault, Luc Armant, Fred Pieri, Russell Ogden and Honorin Hamard.

Dav has a wealth of experience in competition flying, XC, XAlps and paraglider design. Luc, a dedicated XC and competition addict has a background in naval architecture. Fred, our resident geek is a mathematician, mechanical engineer and vol biv specialist. Russ is a competition pilot and test pilot with 1000s of hours testing experience. Honorin has been flying since he was 13 years old, a naturally talented pilot with multiple world records and a world championship title to his name already. Between them, they bring a wealth of knowledge, ideas and experience and work closely together in the design and testing process.

Mike Cavanagh is the boss and multiple winner of the UK XC league. When he's not out flying he generally keeps control of the mayhem. Promotion and team pilots are organised by BASE jumping legend and mini wing specialist Matt Gerdes. He works closely with graphic designer Loren Cox. Loren is a keen pilot from Salt Lake city, USA.

Back in the office Karine Marconi, Chloe Vila and Isabelle Martinez run the show. These wonderful ladies look after the ordering system, the dealers, the design team and the general day to day running of the company - without them it would be chaos.

Our manufacturing facility in Vietnam is headed up by Dr Dave Pilkington who works relentlessly manufacturing gliders and producing prototypes as well as researching materials and manufacturing processes for our future products. He is backed up by a superb team managed by Khanh and Phong with over 700 production staff.

## YOUR ANGEL SQ

Everyone needs an Angel... Representing the latest in lightweight square parachute design technology, the Angel SQ is a parachute you can rely on.

Modern square rescue parachute designs have proven time and again to offer significantly better pendulum stability and sink rate performance than traditional round parachutes, whilst retaining the fast opening times that are critical for safety.

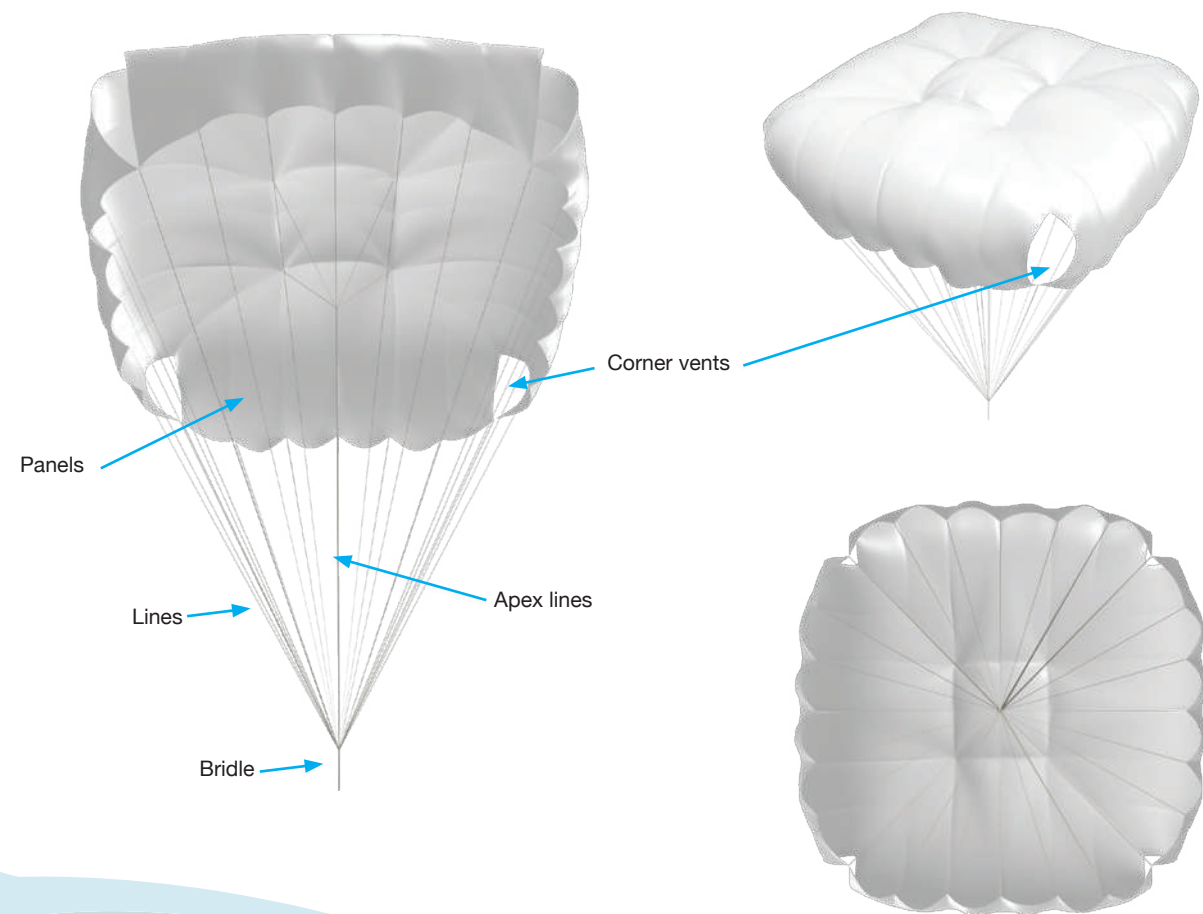
The Angel SQ has a relatively large surface area, yet is very light in weight, giving exceptional sink rate and stability performance with fast opening times. The large surface area ensures an excellent sink rate, all sizes of the Angel SQ provide plenty of margin within the weight ranges they are certified to carry. In terms of parachute performance however, pendulum stability is equally, if not more important than sink rate performance alone and the Angel SQ excels in this department. During the development process, which included many real life test deployments, the Angel SQ's low sink rate and high pendulum stability combined for consistent, safe and comfortable descents.

The Angel SQ uses premium quality parachute materials, Porcher PN9 and Cousin Dyneema lines. These materials have been chosen for their optimum balance of durability, performance, minimal packing volumes and low weight to ensure reliable, safe deployments, even in the most extreme situations.

Certified EN and LTF to the EN 12491 and LTF 91/09 standards, the Angel SQ is available in 4 sizes with maximum loads from 100kgs to 220kgs. There are 2 bridle options: The short bridle version for harnesses with integrated bridles and the Y bridle version for harnesses with no built in bridles.

The Angel SQ has been solely designed for use as an emergency rescue system for paragliders. Do not under any circumstances use this parachute for free fall parachuting, BASE jumping or with any other type of aircraft. The Angel SQ is not suitable for speeds in excess of 32m/s or 115 kmh.





## INSTALLATION TO THE HARNESS

The Angel SQ is available with 2 bridle options: Short bridle or Y bridle.

The short bridle option is for harnesses that already have reserve bridles in place. Attach the parachute bridle to the harness bridles using a Maillon Rapide 7mm screw gate maillon or similar.

The long Y bridle option is for harnesses that do not have bridles already installed. The attachment points should be attached to the shoulder connection points using 2x 6mm screw gate stainless steel maillons (one for each side) along with rubber bands or tape to secure the bridles neatly.

You must NOT attach a long Y bridle to any existing harness bridles. If your harness already has bridles attached to the shoulder hang points, you MUST use the short bridle option. Only attach the Y bridle to the loops located on top of the shoulder straps which have been specifically designed for mounting the rescue system.



**IMPORTANT:**  
You MUST NOT attach the long Y bridle to existing harness bridle(s), if this is the case, you must use the short bridle option.

Maillons must be closed tightly - finger tight then 1/2 a turn with pliers is sufficient. Do not overtighten.

Attach the reserve handle to one of the loops on the deployment bag using a small maillon or a larks foot knot. Please refer to your harness manual to ensure the correct orientation.

The Angel SQ is now ready to be installed into the deployment system of your harness. For detailed instructions of fitting the Angel into the deployment system please consult your harness manual.

**WARNING:** Ozone strongly recommends that the reserve parachute system is installed by a qualified professional. Always seek experienced advice if you have any doubts.



## DEPLOYING YOUR ANGEL SQ

If you are in the unfortunate situation of needing to throw your reserve, do so with conviction:

Look; Reach; Pull; Throw.

Look at the handle, grab it and pull out the retaining pins with sufficient force.

Pull out the deployment bag. You need to adapt the way you pull your parachute depending on the design of your harness's deployment system. e.g. under seat positioning often requires an action to the outside so that the parachute extracts sideways from the pocket, pulling the handle upwards will not allow the parachute to release. Know your equipment and adapt your technique accordingly.

Throw the parachute away from you as hard as you can into clear space, not towards your wing. It is important at this stage to remember to LET GO of the handle. Aim to throw with the direction of airflow to aid a fast opening and against the direction of rotation.

If after throwing the parachute does not deploy (possible in low energy emergencies e.g. parachutal stall), grab the reserve bridle and give it a strong pull. This will help encourage the parachute to open faster.

As the parachute deploys, the next stage is to concentrate on disabling the paraglider. There are several ways to do this – B line stall; rear riser stall; gathering the canopy by working up the A lines until you have the material in your hands or using the brakes to stall the wing. The best technique depends entirely on the situation. The most important thing to remember is to completely disable the wing so that it does not act against the parachute and cause a down-plane. Whichever method you choose do so symmetrically, you do not want the paraglider to start rotating, this could cause the paraglider to fly into and effectively disable the parachute.

Due to the position of the reserve bridle hang points on most harness, deploying the reserve parachute tends to automatically put you in to the PLF position (legs down), if you are not, do everything you can to get yourself into this position so you can absorb the landing impact with your legs.

Always use a PLF when landing under emergency situations or under a rescue parachute.

## PACKING

Your parachute should be repacked **every 6 months**, preferably by a qualified professional to ensure best operation and to give you peace of mind. When removing the parachute from the harness take the opportunity to complete a practice deployment. Check that you can reach your handle easily and that the parachute can exit the harness smoothly, free of any resistance, Certification requires an effort of less than 7kgs.

Before repacking the parachute should have a thorough visual check of the cloth, lines and bridles. Do not use a parachute with any sign of visible damage. The parachute must be completely dry and free of dirt, dust or any other contaminates.

### Packing Procedure

Completely unfurl the parachute, ideally it should be hung overnight to release the folds and to air the material.

To ease the packing process it is best to work with an assistant and have the following pieces of equipment: Weights such as sand bags; Line spacers; Carabiners; Spare elastic bands.

Lay the parachute on a packing table or on the ground. Make sure the surface is clean and dry.

- 1 (Optional). Using a suitable line, route it through the packing loops found 2/3rds of the way up the panels.
- 2 Secure the packing line to something rigid, at the other end secure the bridle to something rigid pulling tension through the parachute cloth and lines. The 'apex' should now be pulled through the centre of the parachute so that the Apex lines are tensioned



- 3** Ensure that the lines are free of twists and tangles - start at the bridle and work towards the parachute keeping the 'apex' lines central and the lines either side separated. Double check that none of the lines are twisted around the 'apex' lines or each other



- 4** Now sort the panels into order. The Angel SQ has 12\* panels per side clearly numbered on the skirt. Fold each panel over to one side keeping the line attachment points neatly together at the skirt end and tension through the cloth.

\*The Angel SQ 220 has 14 panels, otherwise follow the same packing procedure.



- 5** Now neatly organise panels 1 and 12, maintain tension so that all folds are neat. Panels 1-12 should be organised to one side.

\*Panels 1 - 14 for the Angel SQ 220



- 6** Once panels 12 -1 of one side are neatly arranged, it is advised to use weights to keep them in position whilst you repeat the process for the other side. Fold the remaining panels on top of the completed side.

\*Panels 14 - 1 for the Angel SQ 220





- 7** Now repeat the above process, this time in the opposite direction. Panels 1 -12 should be folded neatly on top of each other to the left hand side with the lines grouped neatly and free of twists as before.

\*Panels 1 - 14 for the Angel SQ 220



- 8** The parachute should look as shown with the corner vent of panel 12\* in the middle and on top. The corner vent of panel 1 should be in the middle underneath. At this stage, again double check the lines are free of twists and run cleanly either side of the apex lines all the way to the bridle.

\*Panel 14 for the Angel SQ 220



- 9** Now fold the right hand side underneath using 'S' folds to the width of the deployment bag.



- 10** 'S' fold the left hand side, this time on top of the existing folds to the width of the deployment bag.



- 11** Now arrange the lines keeping them neat and under tension. Use figure of 8 folds and elastic bands around the loops to arrange the lines neatly. The figure of 8s should be made to the same width as the deployment bag. Leave approximately 0.5m of line free at the end before the bridle.





- 12** If you used a packing line, now completely remove it from the loops. Failure to do so will most certainly result in a deployment malfunction.

- 13** Place the deployment bag under the skirt and fold the parachute in an accordion fashion to the size and shape of the deployment bag.



**IMPORTANT:** Before closing the pod, make sure the packing line has been completely removed!

- 14** Close the deployment bag around the parachute, neaten the edges to ensure that the parachute is contained completely within. Use the remaining free line to secure the main loop of the deployment bag.



## CARE AND MAINTENANCE

Your Angel SQ is relatively maintenance-free, however there are several practices that need to be adhered to:

- Keep your parachute free from exposure to UV, moisture, dirt, dust, chemicals or any other contaminates.
- Always store all of your flying equipment in a cool dry room and protect it from direct heat such as radiators or sunlight.
- Moisture, heat and humidity are the worst elements for damaging your parachute.
- Your Angel SQ should be re-packed, preferably by a qualified packer every 6 months. The more often the reserve is repacked the better the chances of it opening quickly.
- Line lengths should be checked annually by a qualified checker, or after anytime the parachute has been exposed to excessive moisture or has become wet after a water landing.
- If you land in salt water, you must immediately rinse the parachute and lines thoroughly with fresh water before it is allowed to dry. It is of vital importance to remove all traces of salt before drying otherwise permanent damage may occur. It may take several rinses to completely remove all traces of salt. If there are any visible signs of damage to the cloth or evidence of salt crystals, the parachute should be deemed un-airworthy and withdrawn from service.
- Completely air dry your parachute out of sunlight or other sources of direct heat. Failure to do so can result in uneven drying of cloth and lines. Your parachute must be absolutely dry before repacking.
- The Parachute should be decommissioned after 10 years, even if it has never been thrown.
- The Angel SQ should be disposed of in an environmentally friendly manner. Do not dispose with normal household waste.

**WARNING:** After a salt water landing, if there are any visible signs of damage to the cloth or evidence of salt crystals, the parachute should be deemed un-airworthy and withdrawn from service.

**WARNING:** The Parachute should be decommissioned after 10 years from the date of purchase even if it has never been thrown.

## OZONE QUALITY GUARANTEE

At Ozone we take the quality of our products very seriously. All products are manufactured to the highest standards in our own facility and go through a series of stringent quality control procedures before delivery. Ozone guarantees all of its products against manufacturing defects or faults for the normal lifetime of the product and will repair or replace any defective product free of charge. Damage caused by tree landings or salt water landings are not covered under warranty.

Ozone and its distributors provide the highest quality service and repair, damage due to wear and tear can be repaired at reasonable charges. We always welcome customer feedback and are committed to excellent customer service. If you are unable to contact your dealer then you can contact us directly at [info@flyozone.com](mailto:info@flyozone.com).

### **Summary**

Safety is paramount in our sport. To be safe, we must be trained, practised and alert to the dangers around us. To achieve this we must fly as regularly as we can, ground handle as much as possible and take a continuous interest in the weather. If you are lacking in any of these areas you will be exposing yourself to more danger than is necessary.

Respect the environment and look after your flying sites.

Finally, RESPECT the weather, it has more power than you can ever imagine. Understand what conditions are right for your level of flying and stay within that window.

Happy flying  
Team Ozone

## TECHNICAL SPECIFICATIONS

Size	100	120	140	220
Surface Area m <sup>2</sup>	29.1	34.8	40.7	63.8
Height (mm)	5850	6400	6550	8900
Line consumption (m)	99.3	133.2	141.6	200.8
Span (m)	5.82	6.37	6.89	8.63
Weight* (kgs)	1.35	1.50	1.72	2.61
Certified Maximum load (kgs)	100	120	140	220
Sink rate at Max Load (m/s)	5.43	5.39	5.39	5.47
Container volume cm <sup>3</sup>	3588	3588	3588	3588
Certification	EN & LTF	EN & LTF	EN & LTF	EN & LTF

\*Weights include deployment bag and short bridle. Add 20g for the long bridled version.

## MATERIALS

 **Cloth**  
Porcher PN9

 **Risers**  
Amsteel 12-3/16 Dyneema

 **Lines**  
**Apex Lines**  
Edelrid 6798 - 210  
**Skirt Lines**  
Cousin 1255







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*Inspired by Nature, Driven by the Elements*

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