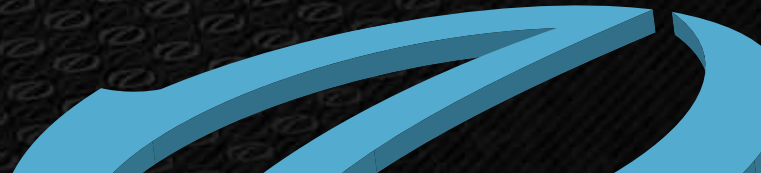




ZENO ZALPS

Pilots Manual



A high-angle, wide shot of a rugged mountain range. The foreground is dominated by a steep, rocky peak with a green, grassy slope leading up to it. In the background, rolling hills and valleys are visible under a blue sky with scattered white clouds. A paraglider with a bright yellow and purple canopy is seen flying in the upper right quadrant of the frame.

ZENO
ZALPS



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THANK YOU

Thank you for choosing to fly Ozone. As a team of free flying enthusiasts, competitors and adventurers, Ozone's mission is to build agile paragliders of the highest quality with cutting edge designs, performance and maximum security.

Confidence and belief in your paraglider is a far greater asset than any small gains in performance - ask any of the Ozone pilots on your local hills, or those who have taken our gliders on ground-breaking adventures or stood on podiums around the world. All our research and development is concentrated on creating the best handling/performance characteristics possible with optimum security. 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.

As pilots we fully understand just how big an investment a new paraglider is. We know that quality and value for money are essential considerations when choosing a new wing, so to keep costs low and quality high we manufacture all of our products in our own production facility. During production our wings undergo numerous rigorous quality control checks that are fully traceable, this way we can guarantee that all of our paragliders meet the same high standards.

It is essential that you read this manual before flying your wing for the first time. The manual will help you get the most out of your new wing, it details information about the design, tips and advice on how best to use it and how to care for your wing to ensure it has a long life and retains a high resale value. For the latest updates, including all technical data please refer to the online version. This can be found on the product's page on at www.flyozone.com

If you need any further information about any of our products please check flyozone.com or contact your local dealer, school or any of us here at Ozone.

Safe Flying!
Team Ozone

WARNING

- Paragliding is a potentially dangerous sport that can cause serious injury including bodily harm, paralysis and death. Flying an Ozone paraglider is undertaken with the full knowledge that paragliding involves such risks.
- As the owner of an Ozone paraglider 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 are excluded.
- Be prepared to practice as much as you can - especially ground handling, as this is a critical aspect of paragliding. Poor control while on the ground is one of the most common causes of accidents.
- Be ready to continue your learning by attending advanced courses to follow the evolution of our sport, as techniques and materials keep improving.
- Use only certified paragliders, harnesses with protector and reserve parachutes that are free from modification, and use them only within their certified weight ranges. Please remember that flying a glider outside its certified configuration may jeopardise any insurance (e.g. liability, life etc) you have. It is your responsibility as the pilot to verify your insurance cover.
- Make sure you complete a thorough daily and preflight inspection of all of your equipment. Never attempt flying with unsuitable or damaged equipment.
- Always wear a helmet, gloves and boots.
- All pilots should have the appropriate level of license for their respective country and third party insurance.
- 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. If you are unsure do not fly, and always add a large safety margin to all your decisions.
- NEVER fly your glider in rain, snow, strong wind, turbulent weather conditions or clouds.
- If you use good, safe judgment you will enjoy many years of paragliding.

Remember, PLEASURE is the reason for our sport

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, he is a naturally talented pilot that has already become world champion. 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 ZENO / Z-ALPS

The Zeno represents the cutting edge of OZONE paraglider R&D. This highly advanced wing bridges the gap between the Enzo and Mantra series, providing an option for expert pilots who are ready to step up. The Zeno is a 2-line design that resembles the Enzo 2 but with the same Aspect Ratio as the M6. Fitting between the M6 and Enzo 2, the Zeno's behaviour, comfort and in-air ease of use rivals that of the Mantra series, yet its performance is incredibly similar to the Enzo 2. Pilots who are comfortable with the M6 or other wings of this class and are looking to upgrade to a 2-liner will find the Zeno to be an excellent introduction to the highest levels of paragliding.

The OZONE R&D team put many hours into developing and testing the Zeno. The all new design has evolved in parallel with the Enzo 3 research program and contains technologies that have improved not only the glide and speed performance, but also the safety related behaviour. With a compact and cohesive structure, the Zeno is solid and surprisingly comfortable in real XC conditions whilst being well behaved in the tests for its class. For experienced XC or competition pilots, the Zeno offers absolute top level performance in a comfortable and accessible package.

Fully optimised for performance, the Zeno is constructed with a blend of 27g Porcher 7000 and Dominico 30D cloth, these are the same materials used for the Enzo 2. Light materials enhance the handling and overall performance of the design through a reduction in sail inertia but these lightweight and high performance materials do require extra care and caution, especially on the ground. Thanks to light cloth the Zeno has a more agile feel and exhibits improved behaviour in collapse recoveries and manoeuvres. The high performance, low drag line set also share's the Enzo 2's philosophy but has been further optimised to save an incredible 12% of total drag to ensure good high speed L/D ratios.

M6 pilots should choose the same size of Zeno. If you are flying an M6 size ML, then choose a Zeno ML. The weight ranges are slightly different, but the Zeno performs well throughout the weight range and comfort / handling are exceptional not only at the upper end of each size. The extended range of the Zeno allows room for a competition harness and a two-reserve system, which is recommended for 2-line designs of this stature.

The Z-Alps is the lightweight version of the Zeno.

Rucksack

Your wing is supplied with a specially designed bag that is light in weight and comfortable. It features a padded hip belt, adjustable ergonomic shoulder straps and extra pockets to store keys, accessories and all those extra bits. Its large volume allows you to store all of your equipment whilst distributing the weight for comfortable hiking.

Brake Lines

The brake line lengths have been set carefully during testing. We feel it is better to have slightly long brake lines and to fly with a wrap (one turn of line around the hand). However, if you do choose to adjust their length please keep in mind the following:

- Ensure both main brake lines are of equal length.
- If a brake handle has been removed, check that its line is routed through the pulley when it is replaced.
- When the brakes are fully released in flight, the brake lines should be slack. There must be a substantial bow in them to guarantee no deformation of the trailing edge when accelerated.
- There must be a minimum of 10cm of free play before the brakes begin to deform the trailing edge. This prevents the trailing edge from being deformed when using the speed system.

Risers

The Zenó has been designed with 2 risers per side. The A riser is covered with coloured webbing, to allow for easy identification.

The A risers are split into two, the smaller riser - holding only the outermost A line - is the 'Baby A' and has been designed this way to make applying big ears simple.

They also feature ergonomic wooden handles for comfortable B riser control.

The risers do not feature trimmers.

IMPORTANT
In the unlikely event of a brake line snapping in flight, or a handle becoming detached, the glider can be flown by gently pulling the rear risers (B-risers) for directional control.

Total Weight in flight

Each Ozone glider has been certified for a defined weight range. We strongly recommend that you respect these weight ranges. If you want better speed, precise handling, and generally fly in mountains and/or in strong conditions, you should choose to fly in the middle to top part of the weight range. If you want a better sink rate, or if you generally fly in flat lands and/or in weak conditions, you should choose to fly near the middle to bottom part of the weight range. Remember, you can always add ballast when conditions are stronger.

For competition flying it is generally better to be in the upper part of the weight range.

Limitations

The Zeno has been designed as a high performance solo XC/competition wing and is for experienced pilots only. It is not suitable for beginner or intermediate pilots, aerobatics, training or tandem flights. To be flown safely, the Zeno requires a high level of piloting skills. Pilots are expected to have an in-depth knowledge of SIV, preferably with recent, direct experience of a high aspect ratio wing. We also expect the pilot to have the necessary active flying skills and quick reaction times to keep a high aspect ratio wing open in turbulent air.

The Zeno was certified with the use of collapse lines and therefore cannot be used for SIV without them. Collapse lines are available to order separately and must be mounted correctly. We strongly recommend expert tuition over water with all the necessary safety precautions in place. Ensure that you fully understand the correct and safe use of this equipment before attempting SIV.

Towing

The Zeno 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. All tow pilots should be qualified to tow, use a qualified tow operator with proper, certified equipment, and make sure all towing regulations are observed. When towing you must be certain that the paraglider is completely over your head before you start. In each case, the maximum tow force needs to correspond to the all up weight of the pilot.

Accelerator System

To set up the accelerator system, first route the lines supplied with the speed system through the harness. Make sure this is done correctly and that the lines pass through all of the pulleys (check your harness manual for instructions). Attach the speed system lines to the accelerator system on the risers with the Brummel hooks. A basic set-up can be performed on the ground: ask a friend to pull the risers tight into their in-flight position whilst you sit in the harness on the ground. Now adjust the lengths of the lines so that the main bar sits just beneath your seat. You should be able to hook your heel in to the lower loop of the accelerator. There must be enough slack in the speed bar to ensure the front risers are not pulled down in normal trim speed flight, but not so long that it is impossible to use the full speed range of the glider. Once set up, test the full range of the accelerator in calm flying conditions and ensure that both risers are pulled evenly during operation. Fine-tuning can be completed when you are back on the ground.

Harness

It is important to set up your harness correctly before flying the wing. Make sure to spend time adjusting your harness's different settings until you are completely comfortable. The chest strap should be set between 44cm and 48cm (between the centre of the hang points) according to your taste.

Reserve Parachute

We recommend that you always fly your Zeno with at least one reserve parachute suitable for your maximum all up flying weight.

Wing

To prepare the wing, lay it out on the top surface and perform a thorough daily check. You should inspect the top and bottom surfaces for any rips and tears or any other obvious signs of damage. Lay out the lines one side at a time, hold up the risers and starting with the brake lines, pull all lines clear. Repeat with the C (uppers), B and A lines, laying the checked lines on top of the previous set, and making sure no lines are tangled, knotted or snagged. Mirror the process on the other side and then inspect the lines for any visual damage. Then inspect the risers for any signs of obvious damage.

To familiarise yourself with the glider it is a good idea to perform practice inflations and small flights on a training hill. This will enable you to set up your equipment correctly.

Take-off checklist:

- Check reserve parachute - pin is in and handle secure
- Helmet on and fastened
- All harness buckles closed - double check the leg-loops again
- Karabiners and maillons done up tight
- Holding the A risers and your brake handles correctly without twists
- Leading edge open
- Aligned in the middle of the wing and directly into wind
- Airspace and visibility clear

Launching

Your Zeno will launch with either the forward or reverse technique. The wing should be laid out in a pronounced arc, with the centre of the wing higher than the tips.

Forward Launch - Nil to Light winds

When the wind is favourable, whilst gently holding the A risers move forward positively, your lines should become tight within one or two steps and the Zeno will immediately start to inflate. You should maintain a constant pressure on the risers until the wing is overhead. Do not pull down or push the risers forward excessively, or the leading edge will deform and possibly collapse making taking-off more difficult and potentially dangerous. Move smoothly throughout the entire launch, there is no need to rush or snatch at it. You should have plenty of time to look up and check your canopy before committing yourself. Once the wing comes overhead, it may require a brake input from stopping it overflying you. Once you are happy that the Zeno is inflated correctly, accelerate smoothly off the launch.

Reverse Launch - Light to Strong Winds

Lay out your wing as you would for the forward launch. However, this time turn to face it, passing one entire set of risers over your head as you turn. Now you can inflate the glider with your body weight and the A-risers. Once the wing is overhead, release the risers, brake if necessary, turn and launch. In stronger winds, be prepared to take a few steps towards the glider whilst braking as it inflates. This will take some of the energy out of the glider and it will be less likely to overfly you or inadvertently pull you off the ground. The reverse-launch technique can be used in surprisingly light winds too.

Turning

The Zeno is very responsive to inputs. To familiarise yourself with the new wing your first turns should be gradual and progressive, application of too much brake will cause excessive roll and dive in the turn, or may cause a spin. To make efficient and coordinated turns, your first input for directional change should be weight-shift, followed by the smooth application of the brake until the desired bank angle is achieved. To regulate the speed and radius of the turn, coordinate your weight shift and use the outer brake or outer B riser.

IMPORTANT

Never take off with a glider that is not fully inflated or if you are not in control of the pitch/roll of your wing.

IMPORTANT

Always check the airspace is clear before initiating a turn.

Speed System

For better penetration in headwinds and improved glide performance in sinking air, crosswinds or headwinds, you should fly faster than trim speed by using the accelerator system. Using up to half bar does not degrade the glide angle or stability significantly and will improve your flying performance. To accelerate, first make sure that you have no brake applied (remove any wraps from the brakes) and take hold of the B risers, we recommend to use the wooden handles. Apply the speed bar smoothly and progressively to avoid sudden changes of pitch/angle of attack (AofA) and to allow the wing to accelerate efficiently. Maintain pressure on the B risers and use active control with a combination of the speed system and the B risers through turbulent air. Only release pressure from the B risers when the air is smooth.

At full speed the Zen0 is fast but has less inherent stability; only use maximum speed in very calm air conditions and always fly actively with the B risers/speed bar.

Active Flying

To reduce the frequency of collapses in turbulent conditions, it is essential to use active flying. The aim of active flying is to control the pitch and internal pressure of the wing. This can be done with the brakes or the B risers (see below), but in very turbulent air, we recommend to always use the brakes.

In turbulent air, fly with the brakes applied (approx. 20cm), this will give you the necessary feedback which is vital to keep the wing open. It is also important to look at your wing as this gives a direct indication of its internal pressure and likelihood of collapse. Inputs can be symmetric or asymmetric; you may have to apply both brakes or just one to maintain equal pressure across the span/chord of the wing. Avoid flying with continuous amounts of deep brake in rough air as you could inadvertently stall the wing. Always consider your airspeed.

Active B Riser Control

When gliding at trim speed or in accelerated flight, we recommend to pilot 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 causes drag and pitch movements). The direct feel allows you to stop collapses before they happen and maintain higher speeds and higher levels of efficiency.

IMPORTANT

Regulate your speed depending on the local airmass. If it becomes turbulent, release the speed system and fly actively with your brakes or B risers.

IMPORTANT

No pilot and no glider are immune to collapses, however active flying reduces the tendency to collapse. When the conditions are turbulent, be more active and anticipate the movements of the wing. Always be aware of your altitude and do not over-react.

To fly with the B risers, keep hold of your brake handles (remove any wraps) and either rest your hands on or take hold of the wooden handles located on the B risers. Now you have direct control of the AofA; by pulling the B risers down or rearwards you increase the AofA, releasing pressure reduces AofA and returns the wing to trim speed. With B riser control you can fly actively through turbulence, collapses can be stopped or at least reduced with correct inputs due to the sudden increase in AofA. If you feel the nose of the wing lose internal pressure, or you see a crease appear between the A and B line attachment points on the sail you can quickly input the B risers to stop the collapse occurring. The amount of pressure and size of the input is dependent on the amount of turbulence, or loss of pressure, but always avoid long deep inputs to avoid inducing large pitch movements or inadvertent stalls.

During accelerated flight, the added control of active B riser flying further increases the efficiency and stability of the wing. Whilst accelerated the act of pulling the B risers is exactly the same as releasing the speed bar. This translates to direct control of speed, AofA, and internal pressure in your hands. Coupled with active speed bar control, adjustments can be made with the B risers to optimise your speed and internal pressure through turbulence helping you to maintain a higher average speed whilst reducing the likelihood of unexpected collapses. When pushing the bar, if the air becomes slightly turbulent apply some pressure to the B risers, when the air becomes less turbulent again you can reduce (or release) pressure on the B risers for extra speed. Flying fast and efficiently in normal air requires constant attention to the wing, it is necessary to combine B riser inputs and speed bar adjustments to keep the wing open and pressured.

This control method is suitable for gliding in good 'normal' air without huge levels of turbulence, it does not replace proper active flying with the brakes in strong turbulent conditions. If you are unsure about the air return the glider to trim speed, release the B risers and fly the glider actively with the brakes.

Big Ears

To pull big ears, keep hold of your brake handles and take the outermost A-line (AR3) on each side, then pull out and down (preferably one at a time) until the wingtips fold under. The size of the big ears can be adjusted by pulling more line, or reaching higher up the line. Once the big ears are engaged you can further increase the sink rate by using the accelerator system. For directional control while using the Big Ears, use weight shift.

IMPORTANT

Whilst accelerated DO NOT use your brakes to fly actively in turbulent air, doing so will actually make the wing more prone to collapse.

IMPORTANT

Always keep hold of your brakes. Do not fly in turbulent conditions

DO NOT perform spiral dives with the Big Ears engaged.

To reopen the ears, release both A lines at the same time. To aid reinflation, brake positively one side at a time until the tips open. Avoid deep symmetric applications of the brake as this could accidentally induce a stall.

Whilst it is possible to enter a spiral dive whilst holding in Big Ears, the high forces applied to the lower lines could exceed the breaking strain of the lines leading to equipment failure! We strongly recommend against doing this.

B-Line Stall

Traditional B-line stalls are not possible with the Zeno. Pulling the B lines firmly will result in a full stall. Do not do it.

DO NOT perform B line stalls.

Spiral Dives

If you turn your glider in a series of tightening 360's it will enter a spiral dive. This will result in rapid height loss. To initiate a spiral, look and lean in to the direction you want to turn, then smoothly pull down on the inside brake. The Zeno will first turn almost 360 degrees before it drops into the spiral. Once in the spiral you should re-centre your weight shift and apply a little outside brake to keep the outer wing tip pressured and inflated.

Safe descent rates of more than 8m/s (1600 ft/min approx.) are possible in a spiral dive, but due to the long lines of the Zeno, very high decent spiral dives with high speeds and G-forces can be very disorientating and could lead to a loss of vision and even black out. Always pay particular attention to your altitude. To exit the spiral dive, move your weight shift to the outside whilst smoothly releasing the inside brake. As the Zeno decelerates allow it to continue to turn until enough energy is lost to return to level flight without an excessive climb and surge.

IMPORTANT
Always be prepared to pilot the wing out of a spiral dive. Use opposite weight shift and apply enough outside brake to stop the wing from spiralling.

Under certain conditions the Zeno may show a tendency to remain stable in a spiral dive, several parameters will influence its behaviour such as: a tight chest strap settings; total weight in flight outside of the certified weight range; or being in a very deep spiral with a very high sink rate $>14\text{m/s}$. You should always be prepared to pilot the wing out of a spiral dive with opposite weight shift and a smooth application of the outside brake, the rotational speed will start to reduce and the glider will start to pull out of the spiral.

Never attempt to recover from a spiral with hard or quick opposite inputs as this will result in an aggressive climb and surge.

Landing

- Always set up for your landing early, give yourself plenty of options and a safe margin for error.
- Once below 30 metres avoid turning tightly as the glider will have to dive to accelerate back to normal flight. If you are at low altitude, or if you hit sink, this could mean you hit the ground harder than necessary. Always land heading into wind!
- Lean forward out of your harness before the actual landing (especially if it's turbulent), with your weight leaning forward against the chest strap.
- Fly hands up trim speed for your final descent until you are around 1 metre above the ground (in windy or turbulent conditions you must fly the glider actively all the way). Apply the brakes slowly and progressively to slow the glider down until groundspeed has been reduced to a minimum and you are able to step onto the ground.
- In light winds/zero wind you need a strong, long and progressive flare to bleed off all your excess ground speed. In strong winds your forward speed is already low so you are flaring only to soften the landing. A strong flare may result in the glider climbing upwards and backwards quickly, leaving you in a vulnerable position.
- Choose the appropriate approach style in function of the landing area and the conditions.
- In strong winds you need to turn towards the glider the second your feet touch the ground. Once facing the wing pull smoothly and symmetrically down on the brakes to stall the wing. If the glider pulls you, run toward it.
- If the wind is very strong, and you feel you might be dragged, or lifted again, stall the glider with the B risers. This stalls the wing in a very quick and controllable way and will drag you less than if you use the brakes.

INCIDENTS IN FLIGHT

Deflations

Due to the flexible form of a paraglider, turbulence may cause a portion of the wing suddenly to collapse. This can be anything from a small 30% (asymmetric) collapse to a complete (symmetric) collapse.

If you have a collapse, the first thing to do is to control your direction. You should fly away from the ground or obstacles and other pilots. Asymmetric collapses should be controlled by weight shifting away from the collapsed side and applying enough brake to control your direction. This action alone will often be enough for a full recovery of the wing, however if the wing remains closed positive brake input is required on the deflated side to encourage reinflation.

Once a glider is deflated it is effectively a smaller wing, so the wing loading and stall speed are higher. This means the glider will spin or stall with less brake input than normal. In your efforts to stop the glider turning towards the collapsed side you must be very careful to not stall the flying side. If you are unable to stop the glider turning without exceeding the stall point then allow the glider to turn whilst you reinflate the collapse.

If you have a deflation which does not spontaneously reinflate, make deep hard inputs on the deflated side. This pumping action should take about 1-2 seconds per pump, pumping too short and fast will not reinflate the wing and pumping too slow might take the glider close to, or beyond, the stall point.

Symmetrical collapses normally reinflate without pilot input, however 15 to 20cm of brake applied quickly and symmetrically will reduce the size of the collapse and speed up the recovery process. After a symmetric collapse always consider your airspeed. Make sure the glider is not in parachutal stall before making any further inputs.

If the wing collapses in accelerated flight, immediately release the accelerator (if applied), manage the collapse using the same methods described above.

IMPORTANT

A bad preparation on launch, aerobatic flying, flying a wing of too high a level or in conditions too strong for your ability are the main causes of cravats.

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.

Deep Stall / Parachutal Stall

It is possible for gliders to enter a state of parachutal stall. This can be caused by several situations including; flying too slowly; flying the glider when wet; or after a front/symmetric deflation. The glider often looks as though it has recovered properly but carries on descending vertically without full forward motion. This situation is called 'deep stall' or 'parachutal stall'.

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.

Do not fly in rain or when the wing is wet, doing so significantly increases the likelihood of parachutal stalls occurring. To reduce the chance of stalling in rain avoid using deep brake movements or Big Ears. Find a safe area to land and using the speed bar, maintain a good airspeed at all times.

IMPORTANT

Only a few cms of input from your brakes can maintain your wing in the stall. Always fully release your brakes to recover normal flight.

IMPORTANT

NEVER fly in the rain or with a wet glider.

SIV and Collapse lines

The Zeno 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. Ozone 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, such as the M6. Ensure that you fully understand the correct and safe use of this equipment before attempting SIV.

Collapse lines are available as an optional extra and should be added to the wing before inducing collapses. Be sure to attach to both sides of the canopy for symmetric deflations. Please consult the rigging diagram on page 26.

Step1 Collapse Risers

Attach the riser line to the loop of the uppermost speed-system pulley located on the A risers. Then attach the maillon to the other end of the collapse riser. Repeat on other side.

Step2 Upper Lines

Attach the upper collapse lines to their corresponding tabs. The tabs can be found at the bottom of the openings along the leading edge. Lines should first be routed through the small holes on the lower surface and then attached to the tab using a larks foot. Z1 attaches to the tab in front of A1a and Z2 to the tab in front of A2a etc. **Please note Z12 does not have its own dedicated tab; it needs to be attached to the A12 tab.**

Step3 Mid Lines

Attach the mid lines: ZM1 joins with Z1 & Z2 only; ZM2 joins with Z3 & Z4 etc...

Step4 Lower Lines

Attach the lower lines to the mid lines: ZR1 joins with ZM1 & ZM2; ZR2 joins with ZM3 & ZM4; and ZR3 joins with ZM5 & ZM6. Join ZR1,2&3 to ZRL1

Step5 Lines to Maillon

Attach ZRL1 to the maillon on the collapse risers. Use the rubber bands or alternatively some sticky tape to secure the maillon in place to prevent it or the line from rotating.

IMPORTANT

Only attempt SIV with this wing if you have previous SIV experience with a high aspect ratio wing, such as the M6.

CARE AND MAINTENANCE

Packing

To prolong the life of your wing and to keep the plastic reinforcements in the best possible condition it is very important to pack the wing carefully.

Ozone recommends to use the concertina packing method exactly as shown so that all of the cells rest alongside each other and the plastic reinforcements are not unnecessarily bent. It is also good practice to use the supplied foam Folding Pillow, this reduces the angle of the leading edge fold and helps preserve the plastic reinforcements. The folding pillow can be compressed with the strap and carried in your harness. Also, using the Ozone Saucisse pack will help preserve the life of the wing and aid with the speed and ease of packing.

Step 1. Lay the mushroomed wing on the ground or on the Saucisse pack if you are using one. It is best to start from the mushroomed position as this reduces the dragging of the leading edge across the ground.



Step 2. Group leading edge (LE) plastic reinforcements with the A tabs roughly aligned. Make sure the plastic reinforcements lay side by side. Note the glider is NOT folded in half; it is folded as a complete concertina from wing tip to wing tip.



Step 3. Group together the middle and the trailing edge (TE) of the wing by sorting the concertina folds near the B and C tabs.



Step 4. Once the LE and TE of the wing have been sorted, turn the whole wing on its side.

If using a Saucisse pack go to Step 7.



Step 5. Strap the Folding Pillow below the LE - at the point of the first fold. The pillow reduces the angle of the fold and helps preserve the plastics. Next fold the TE over the LE being careful to not fold with tight angles.



Step 6. Now place the folded wing into the stuff sack.



Step 7. If using a Saucisse, with the wing laid on its side carefully close the zip (or clips) without trapping any material.



Step 8. Turn the Saucisse on its side, lay the foam Folding Pillow in place and make the fold of the LE around it. Use 3 folds.



IMPORTANT: Do NOT lay the wing flat on the ground before packing the glider, this will cause abrasion damage to the top surface as you pull the glider towards the middle. ALWAYS pack from a mushroom or lift the wing off the ground when gathering the wing and grouping the leading edge.



IMPORTANT: Do not fold the glider in the centre, you will bend the plastics, instead pack the wing with a full concertina method from tip to tip before packing into the stuff sac.



Caring Tips

- DO NOT drag your wing along the ground to another take-off position - this damages the sailcloth. Lift it up and carry it.
- DO NOT try to open your wing in strong winds without untangling the lines first - this puts unnecessary strain on the lines.
- DO NOT walk on the wing or lines.
- DO NOT repeatedly inflate the glider and then allow it to crash back down. Try to keep this movement as smooth as possible by moving towards the glider as it comes down.
- DO NOT slam your glider down on the ground leading edge first! This impact puts great strain on the wing and stitching and can even explode cells.
- FLYING in salty air, in areas with abrasive surfaces (sand, rocks etc.) and ground handling in strong winds will accelerate the aging process.
- DO NOT fly in the rain or expose the wing to moisture. We recommend that all pilots take measures to keep their equipment as dry as possible. We do not recommend intentional water landings or laying out wings on wet launches. Thoroughly wetting the glider fabric may cause colour change, dye transfer, a reduction in longevity, and possibly change the dimensions of the fabric.
- DO NOT expose the wing to unnecessary UV. Pack away once you have finished flying. Do not leave it sitting in the sun.
- If you fly with a wrap, you should regularly undo the twisting that appears on the main brake lines. By twisting the line become shorter and you can end up with a constant tension on the trailing edge (which can lead to problem on launch, stalling, glider not flying symmetrically, ...)
- Be careful when groundhandling to not saw the brake lines against the risers or main lines. The abrasion caused by a sawing motion can damage the main lines and lead to premature ageing of the risers. If you notice any signs of abrasion, especially to the lines, make sure you get the wing professionally serviced and importantly modify your groundhandling technique to stop any further damage.
- Your Ozone wing has an opening closed using Velcro on the trailing edge of the tip called the 'Butt hole'. This has been designed to easily empty all the things which have been accumulating in your wing (sand, leaves, rocks, mobile phones etc).
- It is recommended that you regularly CHECK your wing, especially after a heavy period of use, after an incident or after a long period of storage.

Storage and Transport

Always store all your flying equipment in a cool, dry room protected from direct heat and sunlight. Your wing must be completely dry before being packed away, moisture, heat and humidity are the worst elements for damaging the materials and plastics. Never store a damp glider in the car under direct sunlight for example.

If you land in salt water, you must first rinse it thoroughly with clean fresh water. Dry the wing completely, out of the sun, in the wind. Never use a hair dryer or expose a wet wing to direct sunlight.

Take care that no insects get packed away with the wing. They may eat the cloth and make holes in a bid to escape. They can also leave acidic deposits if they die and decompose.

Transport the wing in the supplied bags and keep away from oils, paints, chemicals, detergents etc.

Cleaning

Any kind of wiping/scratching can damage the coating of the cloth. We recommend to not clean the wing, but if you do have to, use a soft cloth dampened with a small amount of water and use gentle movements little by little across the surface.

Wing Repairs

Always let a registered dealer, professional repair centre or the manufacturer carry out any major or complex repairs, especially those near seam margins.

If you damage the sail:

If the rip is small and in the middle of a panel however you can fix it yourself. You'll find all the materials in the repair kit you need. The fabric can be simply mended with the sticky rip stop/spinnaker tape. When cutting out the patches allow ample overlap of the tear and make sure both sides are different sizes. Make sure to round off each corner of the patches.

You can find more information about repairing your wing on the Ozone website, including step by step instructions with pictures.

IMPORTANT

Never pack away or store your glider wet.

IMPORTANT

Never leave your glider in a hot place.

IMPORTANT

Never use detergent or chemical cleaners.

If you damage a line:

Any line that is visually damaged MUST be replaced immediately. Do not fly with damaged lines. Replacement lines can be ordered them from your local Ozone dealer or directly from our website <http://www.flyozone.com/paragliders/en/shop/lines.php>. Alternatively, use a reputable paragliding service centre to make the replacement lines.

It is important that replacement lines are made from the correct materials and diameters. You should check lengths against their counterpart on the other side of the wing to make ensure symmetry. In fact it is wise to always replace both sides to ensure symmetry. Once the lines have been replaced, inflate and carefully check the wing before flying.

 Maintenance Checks

Your wing, like a car, should be technically checked to ensure proper airworthiness. Your wing should be checked by a qualified professional for the first time after 24 months, or after 100 hours. However, if you are a frequent flyer (more than 100 hrs per year), then we recommend, that you get your glider checked annually. The checker should inform you about the condition of your glider and if some parts will need to be checked or changed before the next normal service check period.

The sail and the lines do not age in the same way or at the same rate; it is possible that you may have to change part or all of the lines during the wing's life. For this reason it is important to do regular inspections so that you know the exact condition of all of the components of your glider. We recommend that inspections are carried out by a qualified professional.

You alone are responsible for your flying kit and your safety depends on it. Take care of your equipment and have it regularly inspected. Changes in inflation/groundhandling/flying behaviour indicates the gliders aging, if you notice any changes you should have the wing checked before flying again. These are the basic elements of the check up (full details and permissible figures can be found on our website): Porosity is measured with a porosity meter, the time taken by a certain volume of air to go through a certain surface of the cloth. The time in seconds is the result. A measurement is done in a several places on the top surface along the span of the glider behind the leading edge.

IMPORTANT
Take care of your glider and make sure you have it checked and serviced according to the schedule.

The tearing resistance of the cloth - A non-destructive test following the TS-108 standard which specifies minimum tear strength for sky diving canopies should be made using a Bettsometer. (B.M.A.A. Approved Patent No. GB 2270768 Clive Betts Sails).

Strength of the lines - An upper, middle and lower A line, along with a lower B line should be tested for strength. Each line is tested to breaking point and the value recorded. The minimum value is 14 G for all A+B lines, calculated from the maximum certified flying weight of the glider. The added minimum strength for the middle lines and for the top lines should be the same. If the breaking strength is too close to the minimum value calculated, the professional should give a period after which you will have to test the strength of the lines again.

Lengths of the lines - The overall length (riser lines + mid lines + upper lines) has to be checked under 5Kgs of tension. The difference between the measured length and the original length should not exceed +/- 10mm. The changes that could appear are a slight shrink on the 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.

Risers - Visual inspection for signs of wear or abrasion. Differences to manual lengths should not exceed +/-5mm.

Canopy check - A full visual check should be carried out: All the components of the wing (stitching, ribs, diagonals, lines, tabs, ...) should be checked for signs of deterioration.

Finally, a **flight test** to confirm that the wing behaves normally should be carried out by a professional.

Modifications

Your Ozone Zeno has been carefully designed and trimmed to give the optimum balance of performance, handling and safety. Any modification results in the glider losing its certification and will also make the wing more difficult and dangerous to fly. For these reasons, we strongly recommend that you do not modify your glider in any way.

OZONE QUALITY GUARANTEE

At Ozone we take the quality of our products very seriously, all our gliders are made to the highest standards in our own manufacturing facility. Every glider manufactured goes through a stringent series of quality control procedures and all the components used to build your glider are traceable. We always welcome customer feedback and are committed to customer service. Ozone guarantees all of its products against manufacturer's defects or faults. Ozone will repair or replace any defective product free of charge. Ozone and its distributors provide the highest quality service and repair, any damage to products due to wear and tear will be repaired at a reasonable charge.

If you are unable to contact your dealer then you can contact us directly at 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.

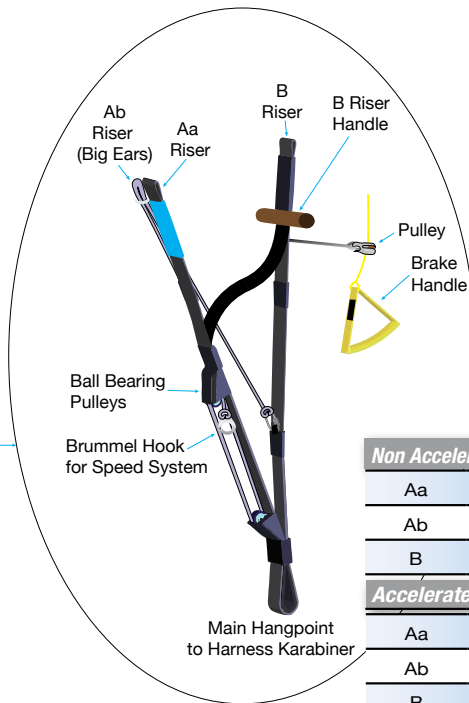
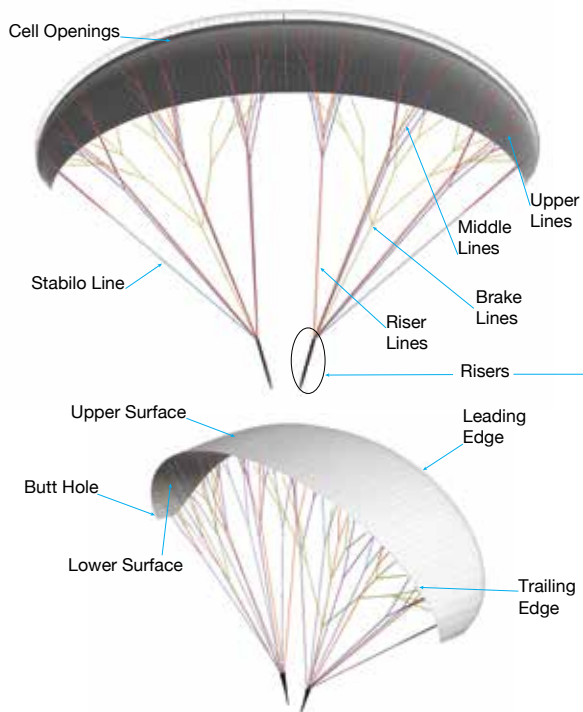
Every year many pilots get hurt launching; don't be one of them. Launching is the time that you are most exposed to danger so practice it lots. Some launch sites are small and difficult and conditions aren't always perfect. If you're good at ground handling you'll be able to confidently and safely launch whilst others struggle...practice as much as you can. You'll be less likely to get hurt and more likely to have a great day's flying.

Respect the environment and look after your flying sites.

If you need to dispose of the wing, do so in an environmentally responsible manner. Do not dispose of it with the normal household waste.

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 & enjoy your Zeno.
Team Ozone



Non Accelerated (inside maillon)

Aa	526mm
Ab	520mm
B	510mm

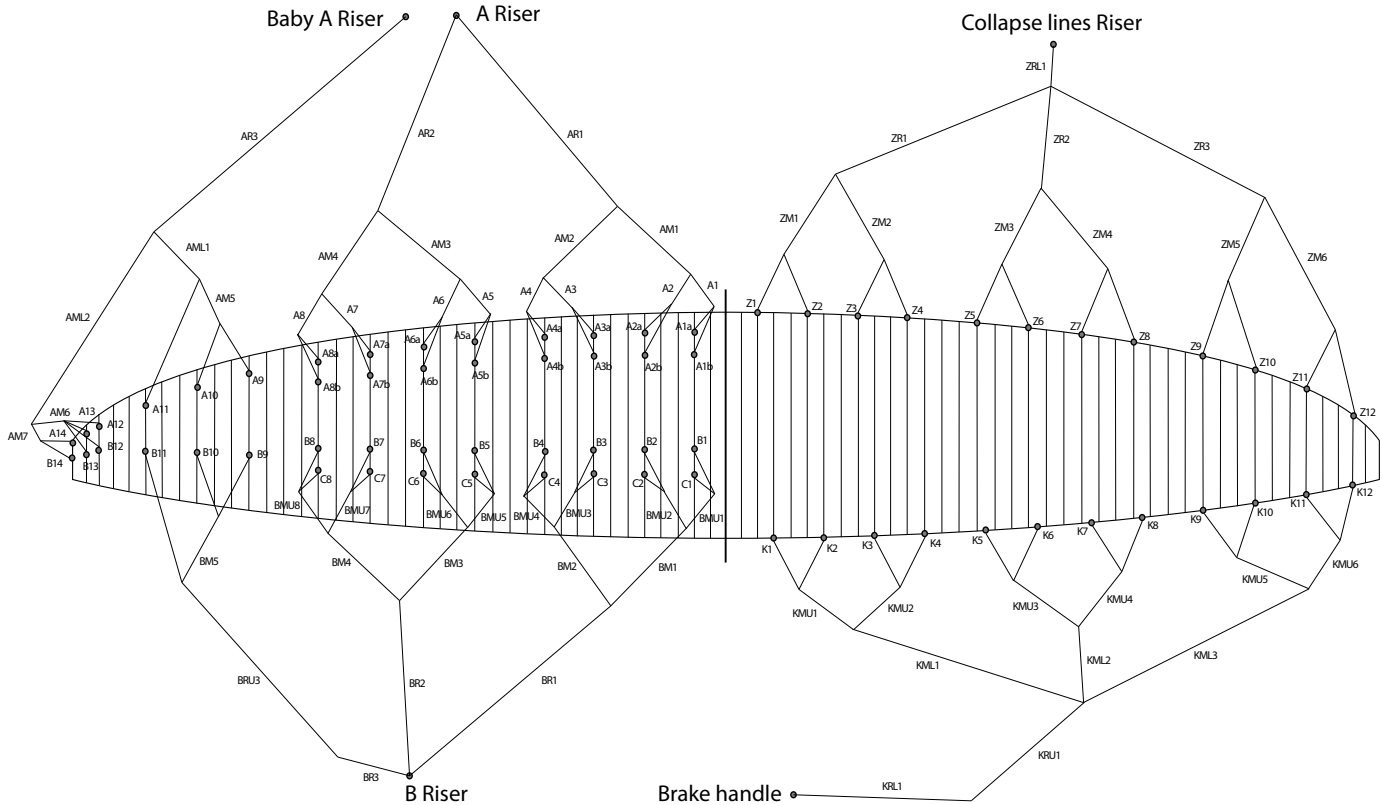
Accelerated (inside maillon)

Aa	373mm
Ab	443mm
B	510mm

Size ML

LINE DIAGRAM

Individual and linked line lengths can be found online.



All Ozone gliders are made from the highest quality materials available.

Cloth

Upper Surface

Dominico DOKDO 30D MF / Porcher 7000 E71

Lower Surface

Porcher 7000 E71

Internal Ribs

Porcher 9017 E29 / Porcher 7000 E91

Leading Edge Reinforcement

2.5/1.8/1.4mm Plastic pipe

Main Line Set

Riser Lines

Edelrid 8000U 360/190/130/050kg - Liros DSL 140kg

Middle Lines

Edelrid 8000U 190/130/090/070/050kg - Edelrid 9200 030kg

Upper Lines

Edelrid 8000U 130/090/070/050kg - Edelrid 9200 030kg

Risers and hardware

Shackles

Maillon Rapide - Pegeut / Z-Alps - LinkLites

Riser webbing

12mm zero stretch polyester / Z-Alps - Dyneema webbing

Pulleys

Ronstan ball bearing

TECHNICAL SPECIFICATIONS

	S	MS	ML	L
No. of Cells	78	78	78	78
Projected Area (m ²)	17.8	19.0	20.4	22.4
Flat Area (m ²)	21.0	22.5	24.1	26.5
Projected Span (m)	9.6	9.9	10.3	10.8
Flat Span (m)	12.0	12.5	12.9	13.5
Projected Aspect Ratio	5.2	5.2	5.2	5.2
Flat Aspect Ratio	6.9	6.9	6.9	6.9
Root Chord (m)	2.19	2.26	2.34	2.45
Weight (Kg)	4.8	5.0	5.3	5.7
Weight (Kg) Z-Alps	4.17	4.36	*	na
Max Control Travel (cm)	65	65	65	65
In-Flight Weight Range	75-90	85-100	95-110	105-125
Certification EN/LTF	D	D	D	D

* To be confirmed.



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France

Inspired by Nature, Driven by the Elements

www.flyozone.com