OWNER'S MANUAL
SPHERA 2 RS

www.swing.de

Dear SPHERA 2 RS owner

THANK YOU FOR CHOOSING A SWING PARAGLIDER!

We hope that you will enjoy many years of flying with your SPHERA 2 RS. Your paraglider stands out for its innovative design, first-rate materials and high-quality workmanship.

It complies with the German airworthiness requirements (LTF) in force at the time of type certification.

The lifespan of your paraglider depends largely on how you handle the material. If you follow the care instructions and treat your SPHERA 2 RS with care, you will enjoy it for a long time.

This Manual is an important part of your paraglider and its type certification. It contains instructions, important advice on safety, care and maintenance, as well as tips on flying technique and general information about the sport of paragliding.

Please read this document carefully before your first flight and familiarise yourself with the instructions regarding operation, safety, equipment, care and service.

If you have any questions that are not answered in this Manual, please contact your SWING dealer or SWING directly. Our contact details are given in the Appendix.

We wish you many enjoyable flights with the SPHERA 2 RS and always “happy landings”!

Your SWING Team

This paraglider is equipped with SWING Ram Air Section Technology (RAST).

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INFORMATION

SWING Flugsportgeräte GmbH reserves the right to update and supplement the contents of this Manual at any time. You should therefore regularly visit:

www.SWING.de

There you will find further information about your paraglider and any updates to the Manual. For detailed information on how to use the SWING website, please refer to the section “SWING on the World Wide Web”

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WARNING

Read the Manual before use!

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01 Introduction

Manual

It is essential that you read this Manual carefully before your first flight. This will allow you to familiarise yourself with new functions and learn how best to fly the paraglider in various situations and how to get the most out of it.

Information in this Manual on the design of the paraglider, technical data and illustrations is subject to change without obligation. We reserve the right to make changes without prior notice.

Special text giving safety information is identified in accordance with the ANSI Z535.6 standard.

This Manual complies with the guidelines of the current German airworthiness requirements for paragliders and forms part of the type certification.

It consists of three parts in total, which contain the following:

1. Manual (this document):

   Instructions on getting started and operating the paraglider
2. Maintenance and Service Book (PDF/download):

   Technical data and glider-specific information for the inspection
3. Inspection Information (PDF/download):

   General instructions and guidance on carrying out the regular inspection of paragliders

Special text

DANGER

Sections of text headed “Danger” indicate an **imminently** hazardous situation in which **death or serious injury will** in all probability result if the instructions are not followed.

WARNING

Sections of text headed “Warning” indicate a potentially hazardous situation in which **death or serious injury may** result if the instructions are not followed.

CAUTION

Sections of text headed “Caution” indicate a potentially hazardous situation which may result in **minor or slight injury** if the instructions are not followed.

PLEASE NOTE

Sections of text headed “Please note” indicate possible **damage to property** which may occur if the instructions are not followed.

TIP

Sections of text headed “Tip” give advice or tips that make it easier to use the paraglider.

Series of instructions

Procedures in which steps must be carried out in a specific order are numbered consecutively in this Manual.

< Where there is a series of pictures with step-by-step instructions, each step has the same number as the corresponding picture.

d Letters are used where there is a series of pictures but the order of the instructions is not relevant.

Lists of parts

Numbers circled in red (e.g.❶) in overview pictures refer to various parts. The number appears again in the list of parts following the illustration, where the part is described.

Bullet points

Bullet points are used for lists in this Manual.

Example:

- Risers
- Lines

QR codes

QR codes are included at various points in this Manual. They take you to the links given in the corresponding text.

SWING Flugsportgeräte and the environment

Environmental protection, safety and quality are the three core values of SWING Flugsportgeräte GmbH and they shape everything we do. We also believe that our customers share our environmental awareness.

Respect for nature and the environment

You can easily help to protect the environment by practising our sport in a way that spares nature and the landscape. Please keep to marked paths, do not leave any litter, avoid unnecessary noise and respect the sensitive biological balance of nature. Consideration for nature is especially important at the launch site!

If you smoke, please do not leave any cigarette butts at the launch site.

Paragliding is an outdoor sport - protect and preserve our planet's resources.

Environmentally friendly recycling

SWING considers the entire life cycle of its paragliders, which ends with environmentally friendly recycling. The synthetic materials used in a paraglider must be disposed of properly. If you are unable to arrange environmentally friendly disposal, SWING will be happy to recycle the paraglider for you. Simply send the glider with a short note to the address given in the Appendix.

02 Safety

WARNING

The instructions given in this Manual must be followed under all circumstances.

Failure to do so invalidates the glider's certification and/or results in loss of insurance cover, and can lead to serious or even fatal injuries.

This applies in particular, but not exclusively, to the instructions in the sections Safety, Flying Practice, Types of Use and Dangerous Situations and Extreme Flying

Safety advice

All forms of air sport involve risks. Compared with other air sports, paragliding has the lowest rate of fatal accidents measured against the number of licence holders.

However, few other sports demand as much personal responsibility as paragliding. Precisely because paragliding is so easy to learn and practically anyone can do it, prudence and risk awareness are basic requirements for practising this sport safely. Carelessness and overconfidence can quickly lead to critical situations. A reliable assessment of the flying weather is particularly important. Most serious paragliding accidents are caused by pilots misjudging the flying weather.

In Germany, paragliders are subject to the regulations for air sports equipment and must never be flown without a valid pilot licence. Self-teaching is strictly prohibited, and this Manual is no substitute for training at a flying school.

Before the first flight, the paraglider must be test-flown and inspected by a specialist. The test flight must be recorded on the information label.

Carry out your first flight with your paraglider on a training slope. For this flight and all others, always wear a certified harness, reserve parachute, helmet, gloves, sturdy footwear with ankle protection and suitable clothing. Only launch if the wind direction, wind speed and weather conditions, as well as their further development, allow a safe flight.

If the paraglider is resold, the Manual must be passed on to the buyer. It forms part of the certification and belongs with the paraglider.

The SPHERA 2 RS was developed and tested solely for use as a paraglider for foot launching and winch towing. Any use other than that intended is not permitted. Under no circumstances use the paraglider as a skydiving canopy or emergency parachute. Aerobatics are not permitted.

Observe the other specific safety advice given in the individual sections of this Manual.

Safety notices

Safety notices are issued when defects are found during operation of a paraglider which could possibly also affect other gliders of the same model.

The notices contain instructions on how to inspect the gliders concerned for possible defects and the measures required to rectify them.

WARNING

The owner is responsible for implementing the measures required by the safety notices.

SWING publishes on its website all technical safety notices and airworthiness directives issued for SWING products.



Safety notices are issued by the certification bodies and are also published on their respective websites. Services such as RSS are available that allow internet users to keep track of various websites and their changes without having to visit each one individually. This makes it possible to follow far more information than before. You should therefore visit the safety pages of the certification bodies regularly and keep yourself informed about new safety notices covering all paragliding products (see Appendix for addresses).

Exclusion of liability and warranty, operating limits

Use of the paraglider is at your own risk!

The manufacturer cannot be held liable for any personal injury or material damage arising in connection with SWING paragliders. Any modification (to the paraglider design, but also to the brake lines beyond the permissible tolerances) or improper repair of this paraglider, as well as missed inspections (annual and 2-yearly check), will invalidate the certification and the warranty.

Every pilot is responsible for their own safety and must ensure that the airworthiness of the aircraft is checked before every launch. A launch may only take place if the paraglider is airworthy. In addition, when flying outside Germany, the pilot must comply with the regulations in force in the respective country.

The paraglider may only be used with a pilot licence valid for the flying area or under the supervision of a state-approved flying instructor. Any liability on the part of third parties, in particular the manufacturer and distributors, is excluded.

Intended use

The SPHERA 2 RS may only be used as “light aerial sports equipment” with an empty weight of less than 120 kg in the paraglider category.

Exclusion of liability and warranty

Under the terms of liability and warranty, the paraglider must not be flown if one or more of the following apply:

- the inspection interval has expired, or the inspection was carried out by unauthorised bodies or persons
- insufficient experience or training of the pilot
- inadequate or missing equipment such as reserve parachute, back protector and helmet
- winch launches using winches that have not been inspected or by unlicensed pilots and/or winch operators

Operating limits

⚠ WARNING

Compliance with the operating limits must be ensured throughout the entire flight.

Take the development of the weather and the temperature into account when planning your flight. Remember that the temperature drops as altitude increases.

The paraglider may only be operated within the operating limits. These are exceeded if one or more of the following apply:

- use outside the permissible weight range
- use with a number of occupants other than that permitted
- flying in rain (including drizzle), in cloud, fog and/or snowfall
- flying with a wet canopy
- turbulent weather conditions and wind speeds at launch higher than 2/3 of the glider's maximum achievable airspeed (depending on take-off weight)
- temperatures below -30°C or above 50°C
- aerobatics / extreme flying or flight manoeuvres with bank angles of more than 135 degrees
- unapproved modifications to the canopy, lines or risers

Glider class and guidelines

⚠ WARNING

All descriptions of flight characteristics contained in this Manual are based on experience gained during the test flights.

These are carried out under standardised conditions.

The classification merely describes the reactions to these standard tests - generally without any initial pilot input.

Because of the complexity of the paraglider-harness system, flight behaviour and reactions to disturbances can only be described in part. Even a small change in individual parameters can result in flight behaviour that differs markedly from the description.

Environmental conditions such as temperature, humidity and air pressure can also influence flight behaviour.

The German Hang Gliding and Paragliding Association (DHV), together with its safety department and other German certification bodies, has drawn up guidelines based on many years of analysing paragliding accidents and on the experience of flying schools, flying instructors and safety training instructors. These guidelines are intended to help pilots choose the glider class appropriate to their flying ability.

The following information on flight characteristics and required pilot skills refers to the EN/LTF classes and is partly taken from the LTF. Further information is available on the website of the respective certification body.

EN/LTF classification

In the final classification, the test centre placed the SPHERA 2 RS in class C.

Description of flight characteristics

Paraglider with demanding flying characteristics and potentially violent reactions to turbulence and pilot errors. Recovery to normal flight requires precise pilot input.

Description of required pilot skills

For pilots who are well practised in recovery techniques, who fly very actively, who have significant experience of flying in turbulent conditions and who accept the implications of flying such a glider."*

Pilots must also be familiar with the specific handling of 2-liner gliders.

Target group

The SPHERA 2 RS is aimed at ambitious XC pilots and performance pilots with extensive flying experience of at least approximately 75 flying hours per year who want to achieve peak performance, for example in cross-country flying.

Thanks to RAST, the SPHERA 2 RS offers pure flying pleasure at an outstanding level of performance and safety.

We recommend that pilots who wish to fly the SPHERA 2 RS without sufficient experience of 2-liner gliders receive a briefing on the particular characteristics of this glider class.

Suitability for training

The SPHERA 2 RS is generally not suitable for training.

03 Technical Description

General layout illustration

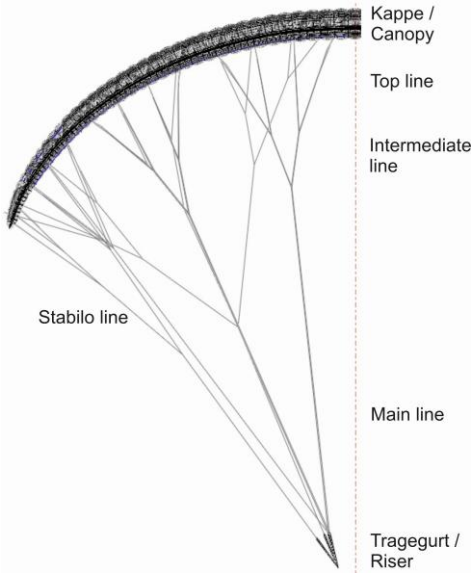


Fig. 1. Wireframe model of the SPHERA 2 RS

SPHERA 2 RS ...FLY FAR. THEN FURTHER.

Big XC days are decided not just by performance, but by how long you can sustain it.

The SPHERA 2 RS stays calm, predictable and efficient, so you stay mentally sharp even after many hours in the air and keep making the right decisions.

The completely new profile delivers high coherence, strong pitch stability and precise handling. The SPHERA 2 RS is lighter and faster than its predecessor. It combines outstanding performance with high profile stability and light, efficient handling across the entire speed range.

Flying a 2-liner has never been so comfortable, nor has it ever been so easy to unlock its full performance potential.

We developed the SPHERA 2 RS for experienced XC and competition pilots who fly long distances at a high level and want to combine maximum performance with clear, predictable flight behaviour.

RAST

The SPHERA 2 RS features SWING's unique Ram Air Section Technology, RAST for short.

This system divides the interior of the paraglider into several chambers running crosswise to the direction of flight.

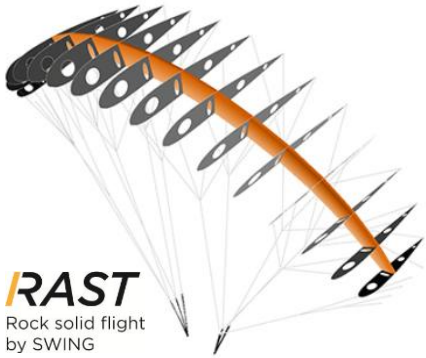


Fig. 2. RAST model drawing

Defined openings regulate the inflowing and outflowing air in such a way that it influences how the canopy fills (during launch) and how it empties (in the event of canopy disturbances).

Inflation behaviour

During inflation, RAST slows down the inflowing air. As a result, the front part of the profile, which is relevant for the airflow, takes shape much more quickly and the glider immediately begins to rise off the ground. During the rest of the inflation, the rear part of the canopy fills with air only slowly, which results in very harmonious and even launch behaviour without any tendency to overshoot or to pluck the pilot off the ground.

Flight behaviour

RAST really plays to its strengths in turbulent air: it effectively stabilises the canopy and gently smooths out rough air.

Its more direct and precise handling provides more control in turbulent conditions.

This makes the SPHERA 2 RS extremely stable and forgiving, which means noticeably more flying comfort, precision and effective performance for the pilot.

Collapse behaviour

Thanks to RAST, the SPHERA 2 RS has above-average collapse resistance.

In the event of canopy disturbances, RAST prevents the canopy from emptying suddenly and/or completely, because the air cannot escape as quickly from the rear section.

A paraglider with RAST deflates more slowly, turns away less and reopens more quickly.

As a result, the height loss is significantly lower than for the same design without RAST.

However, it still allows a sufficiently large area of the glider to collapse in order to dampen and dissipate the energy acting on it.

Increasing brake pressure on the intact side and long stall travel make it more difficult to oversteer in the event of canopy disturbances.

With RAST, large collapses of more than 50% of the chord can only be simulated with great difficulty and, according to extensive experience, are of no practical relevance even in very thermic and turbulent conditions.

TIP

Do not let the extra safety offered by RAST tempt you into taking greater risks. Instead, use RAST as your personal crumple zone in case you ever misjudge the conditions.

Line system

The SPHERA 2 RS has A and B main line levels, which fork twice from the bottom (riser) to the top (canopy) and are divided into “Main”, “Middle” and “Top” lines. The top lines additionally fork into a double attachment.

The Maintenance and Service Book contains a detailed line plan showing the individual levels, connections and line designations.

On the brake lines, the individual levels are gathered together at the end into the main brake line. This runs through the guide ring on the riser and is knotted to the brake swivel of the control handle. There is a mark on the main brake line that allows the correct positioning of the control handle.

All main lines are attached to the riser quick links.

Risers

The SPHERA 2 RS is equipped with specially developed risers made of twelve-millimetre-wide webbing with Kevlar reinforcement. They feature a speed system that allows pilots to adjust the speed of the SPHERA 2 RS to suit their preferences via a pulley system.

More detailed information on using the speed system can be found in the section “Flying Practice”.

⚠ WARNING

The quick links are effectively secured against unintentional opening with Loctite® ex works. After maintenance work, it is essential to secure any quick links that have been opened against unintentional opening again.

Technical data

SPHERA 2 RS	S	M	L
Class	C	C	C
Canopy weight [kg]	4,8	5,1	5,5
Recommended take-off weight (min - max) [kg]	82-94	92-104	102-116
Certified take-off weight (min - max) [kg]	85-95	90-105	100-118
Projected area [m²]	18,5	19,8	21,9
Wingspan [m]	12,1	12,5	13,2
Aspect ratio	6,7	6,7	6,7
Number of cells	75	75	75
Number of risers	3	3	3
Maximum symmetric control travel at maximum take-off weight [cm]	50	60	60
Maximum speed system travel [mm]	200	200	200

Further technical data and material information can be found in the Maintenance and Service Book.

04 Setting Up and Test Flying

Before the first flight

WARNING

Before the first flight, the paraglider must be test-flown and inspected by a specialist. The test flight must be recorded on the information label.

During production, the SPHERA 2 RS undergoes several quality checks and, at the end, a thorough individual inspection.

Despite the utmost care in production, the line set still “settles” slightly under the loads in flight. This is taken into account during production. The optimum trim must be checked regularly at the beginning.

WARNING

Any modification or improper repair of this paraglider will invalidate the certification and the warranty.

Adjusting the main brake lines

Correctly adjusted brake lines have approximately ten centimetres of free travel. This means that you have to pull the brakes down by this distance before the trailing edge of the paraglider is pulled down and a braking effect begins. Note that the brake cascade already exerts a pull through its aerodynamic drag.

If you want to change the brake setting, never exceed or fall below the tolerances specified for the SPHERA 2 RS in the Maintenance and Service Book.

Factory setting

The SPHERA 2 RS is delivered ex works with a brake setting designed for optimum handling.

This setting allows you to steer and land the paraglider almost without delay.

The main brake lines are checked by a specialist before the glider is test-flown and must be knotted so that the mark is visible approximately five millimetres above the knot.

Incorrect settings

WARNING

Main brake lines that are set too short cause the following dangers:

- the airflow over the paraglider can separate earlier
- the paraglider has poor launch characteristics; there is a risk of deep stall
- the paraglider shows dangerous behaviour in extreme flying
- In accelerated flight, the trailing edge of the paraglider is braked, which in extreme cases can cause a frontal collapse.

Environmental influences can also shorten the brake lines. You should therefore check the brake line length regularly, particularly if launch or flight behaviour changes.

If the main brake lines are set too long, the paraglider reacts sluggishly and is difficult to land. Wrapping the brake line briefly around your hand changes the setting in flight and improves the flight characteristics. Adjust the brake lines to the correct length after landing. Changes to the brake travel should only ever be made in small increments of no more than two to three centimetres and must be checked on a training slope. Always ensure that the left and right brakes are adjusted symmetrically.

If you shorten the brake setting, take particular care that the paraglider is not slowed down by brake lines that are too short in trim flight and accelerated flight. Brakes that are shortened too much not only impair performance and launch characteristics but can also cause safety problems.

Brake knots

The overhand knot shown below is the most suitable knot for connecting the brake line to the brake handle.

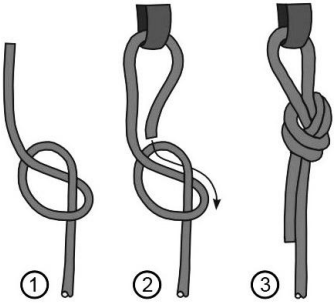


Fig. 1. Overhand knot

There is a swivel at the connection between the brake line and the brake handle ❹, which prevents the main brake line from twisting.

⚠ WARNING

Loose, unsuitable or incorrectly tied brake knots can cause the main brake line to come undone and lead to loss of control of the paraglider.

Always make sure that only overhand knots are used for the connection and that they are tied correctly.

Adjusting the brake handles

The SPHERA 2 RS is equipped with the SWING Duogrip brake handle, which can be optimally adapted to the pilot's needs.

Adjusting handle stiffness

The stiffeners in the brake handle can be adapted to the pilot's individual preferences. Removing the stiffeners gives a choice of two different levels of stiffness on the brake handle.

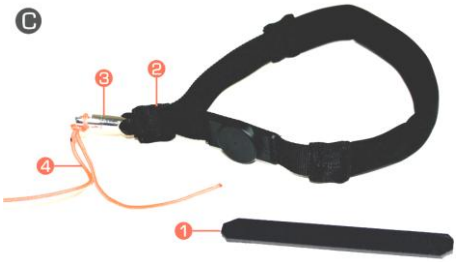
Removing and inserting the stiffeners in the SWING Duogrip brake handle



Duogrip brake handle as delivered, with stiffener



To remove the stiffener, turn the Duogrip brake handle inside out and push the rod out through the opening provided



Duogrip brake handle after removing the stiffener. Overview of the individual parts:

❶ Stiffener (rod)

❷ Duogrip brake handle without stiffeners

❸ Brake swivel

❹ Main brake line

Fig. 2. Sequence for removing the handle stiffener

To insert the stiffeners, follow the same procedure as for removing them. Turn the Duogrip brake handle inside out and push the required stiffeners back into the handle through the opening.

Speed system

The SPHERA 2 RS already has a sufficiently high trim speed, which can be increased considerably by using the additional speed system. This is particularly useful in strong headwinds, on valley crossings or to leave a dangerous area - provided the conditions allow it to be used safely.

The two A-risers can be shortened differentially using the speed bar. This reduces the original angle of attack of the canopy and the speed increases.

The speed bar is connected to the riser by special Brummel hooks.

Correct fitting and adjustment of the speed system is an important requirement for smooth use in flight later on. The length should therefore be adjusted individually and the routing of the speed system lines checked before the first launch.

Adjust the length of the speed system so that your legs are fully stretched in maximum accelerated flight (with both riser pulleys touching each other). Otherwise, you may experience symptoms of fatigue on long flights.

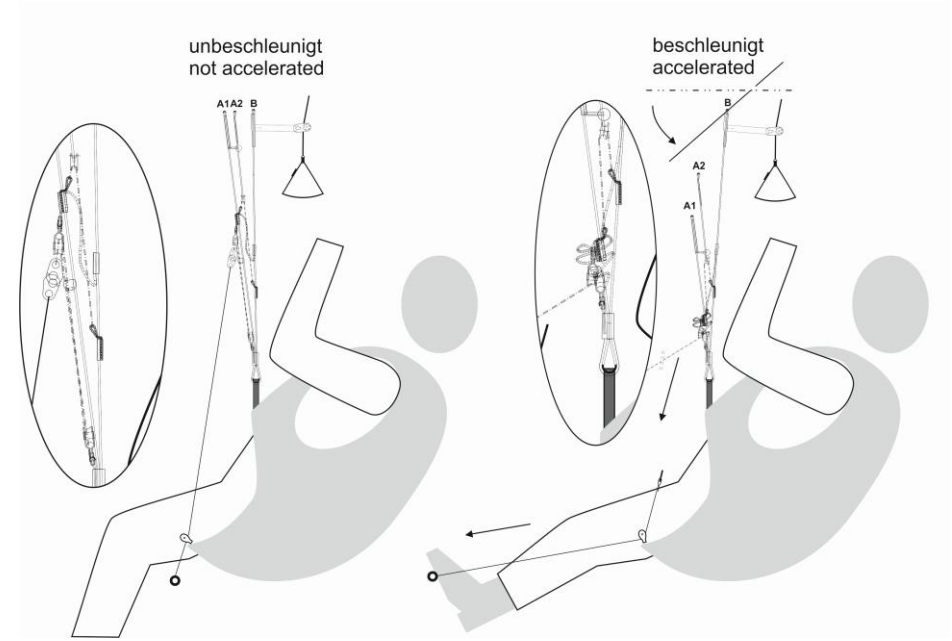


Fig. 3. How the SPHERA 2 RS speed system works

⚠ WARNING

Do not set the speed system too short. Under no circumstances must the glider be pre-accelerated because the setting is too short.

At increased airspeed, disturbances have a more drastic effect than in unaccelerated flight. Because of the increased risk of collapse, using the speed system in turbulent areas and close to the ground is generally not recommended.

Do not apply the brakes symmetrically in accelerated flight. Pulling down hard on both brakes can deform the profile and, in extreme cases, cause a frontal collapse.

You should still be able to sit in a comfortable position when the speed system is fully pushed out.

If the speed system is set too long, you will not be able to use the full potential of the paraglider.

Attach the speed bar to the harness before launch to avoid tripping over it during inflation or the take-off run.

B-steering

Thanks to the positioning of the B-level, the SPHERA 2 RS allows small corrections and brief speed adjustments to be made using the rear B-risers. Handles are fitted to the risers for this purpose.

When making corrections with B-steering, keep the brake handles in your hands and take hold of the B-handles. You now have direct control over the angle of attack of the glider. A light pull reduces the speed; as soon as

you release the handles, the glider flies at its previous speed again.

TIP

With B-steering, the canopy responds very directly and dynamically. If you have no experience with this type of control yet, you should first practise the effectiveness and reactions of B-steering in calm conditions.

B-steering is suitable for flying in moderately active air. B-steering is not recommended in strong turbulence. In these conditions, fly with normal brake input!

Other features

The SPHERA 2 RS has neither a trimmer nor any other adjustable, removable or variable features.

Recommended weight range

The weight ranges given in this Manual always refer to take-off weight (pilot weight including clothing, glider, harness and equipment). Determine your take-off weight by standing on a scale with all your equipment.

The SPHERA 2 RS must be flown within the certified weight ranges.

In addition to the certified weight range, SWING specifies a recommended weight range for the SPHERA 2 RS. Within this range, the flight characteristics of the SPHERA 2 RS are particularly well balanced. If you are above or below this range, the following explanations on dynamics as a function of wing loading apply to a particular degree.

SWING offers the SPHERA 2 RS in different sizes. If you are choosing between two sizes, you should take your personal preferences into account.

If you prefer very dynamic, responsive and immediate flight behaviour, you should choose a high wing loading and therefore the smaller size.

In the middle and lower weight range, the dynamics are reduced. The flight behaviour becomes easier to manage and climbing in weak thermals is slightly better. If you prefer these characteristics, you should fly with a lower wing loading and choose the larger size.

You can therefore choose the size entirely to suit your personal flying style.

Ballast

If you want to adjust your take-off weight with ballast, make sure it is positioned correctly.

Wherever possible, the ballast should be stowed in the dedicated pockets of the harness. If your harness does not have separate ballast pockets, attach the ballast symmetrically, as close as possible to the centre of gravity or underneath the seat board.

Do not attach any additional ballast to the main suspension points of the harness.

WARNING

Additional ballast can affect the pilot's centre of gravity and the flight behaviour of the paraglider.

Incorrectly attached ballast can make extreme flying and spiral behaviour in particular considerably more demanding.

Reserve parachute

Carrying a certified reserve parachute is mandatory for emergencies involving a permanent failure of the paraglider, for example after a collision with another aircraft.

When choosing a reserve parachute, make sure that the intended take-off weight is within its limits. The reserve parachute must be fitted in accordance with the manufacturer's instructions.

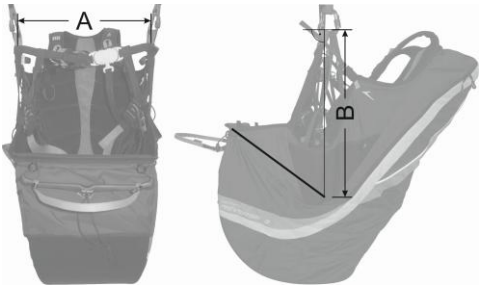
Suitable harnesses

Harnesses without cross-bracing (GH) are generally suitable for use with the SPHERA 2 RS.

Make sure that the pulleys of your harness allow you to use the maximum speed system travel.

If you have any questions or doubts about using your harness with the SPHERA 2 RS, please contact your SWING dealer or SWING directly.

Harnesses with the following dimensions are used for type certification:



Total flying weight	Width (A)	Height (B)
< 80 kg	(40±2) cm	(40±1) cm
80– 100 kg	(44±2) cm	(42±1) cm
> 100 kg	(48±2) cm	(44±1) cm

Width (A): horizontal distance between the riser attachment points (measured from the centre lines of the karabiners).

Height (B): perpendicular distance from the riser attachment points (measured from the centre lines of the karabiners) to the top of the seat board.

Harness influence

Studies have shown that the harness, the harness settings and the pilot's position in the harness have a significant influence on the flight behaviour of the paraglider, as does the use of reserve parachutes in front containers.

As a result, the flight behaviour of the glider-harness combination chosen by the pilot can differ significantly from that documented during type certification. The figure below shows examples of how different harness geometries influence flight behaviour.

Please take your personal preferences into account when choosing a harness.

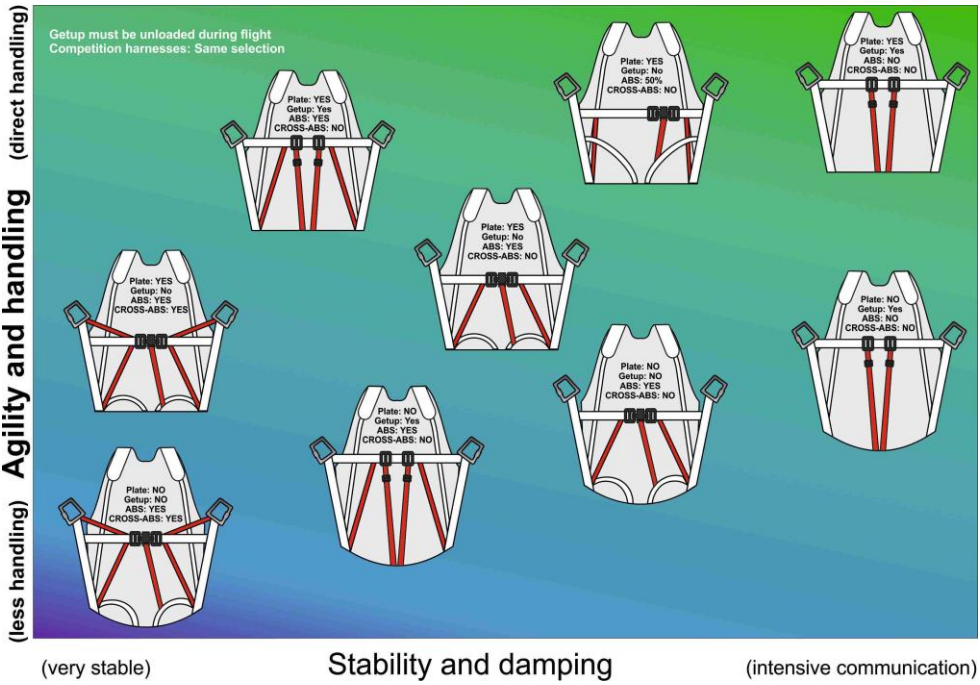


Fig. 4.Overview of different harness geometries and their damping

05 Flying Practice

First flight

Before the first flight, the paraglider must be test-flown and inspected by a specialist. The test flight must be recorded on the information label.

Only make your first flights in calm weather, in familiar terrain or on a training slope. At first, steer smoothly and with measured inputs so that you can get used to the glider's reactions without stress.

WARNING

Do not overestimate your abilities. Do not let the classification of the paraglider or the overconfidence of other pilots tempt you into reckless behaviour.

Pre-flight check and laying out

Before every launch, carefully check the following points:

- No tears or other damage to the sailcloth
- No knots or tangles in the lines
- Brake lines running freely and firmly attached to the handle
- Correct brake line length setting
- Quick links on the lines and risers checked (firmly closed and secured)
- Glider is dry
- No damage to the risers or seams
- No damage to the harness
- Reserve handle correctly secured

WARNING

A thorough pre-flight check is mandatory for every aircraft. Make sure that you carry out every check with the same care.

Lay out the paraglider with the top surface on the ground and spread out the open cell openings in an arc.

Carefully sort all the lines and make sure that no lines are lying under the canopy, forming loops or likely to snag.

WARNING

If the glider shows pronounced creases after long storage in the stuff sack or heavy compression, you should do a few inflation exercises and smooth the leading edge slightly before the first launch. This ensures that the airflow attaches cleanly to the profile during the launch phase. Smoothing the leading edge is especially important at low temperatures.

5-point check

With the 5-point check, the pilot checks the most important safety-relevant points once more immediately before starting the take-off run.

To make sure that nothing is forgotten, always check them in the same order. They are:

1. Personal equipment (harness, karabiners, reserve parachute and helmet) correctly put on and all buckles closed?

2. Glider laid out in an arc and all cell openings open?
3. All lines sorted; no lines under the canopy, risers free and untwisted?
4. Does the weather, in particular wind direction and strength, allow a safe flight?
5. Airspace and launch area clear?

Launch

In light winds, a forward launch is recommended with the SPHERA 2 RS. Inflate the glider with the lines of the A1 riser tensioned. It is not necessary to launch the SPHERA 2 RS with an impulse and/or to run into slack lines.

During inflation, guide both A1 risers upwards in a smooth, arc-shaped movement without shortening them. Avoid pulling hard on the risers. The SPHERA 2 RS rises very easily and is easy to control. Laying out the leading edge cleanly in an arc helps the launch considerably.

From wind speeds of 3 m/s, the SPHERA 2 RS is also very easy to launch using a reverse launch. The pilot stands facing the paraglider with the wind at their back. By pulling on the front lines, the canopy starts to rise above the pilot, as in the forward launch. Once the canopy has reached its highest point, the pilot must turn round to face the direction of flight and can then run into the wind and take off.

With this launch method, it is easier for the pilot to control the rising canopy and make fine corrections. This technique is therefore particularly recommended in stronger wind conditions.

In addition, 2-liner gliders are highly dynamic during inflation in strong winds and can overshoot considerably.

⚠ WARNING

At higher wind speeds (from approximately 6 m/s), the paraglider must be actively held on the ground. Otherwise, the glider may rise above the pilot on its own.

ⓘ PLEASE NOTE

During a reverse launch and during ground handling, make sure that the brake lines do not rub over the lines and risers.

This can damage the lines or the riser.

Straight flight

With the brakes fully released, the SPHERA 2 RS flies straight ahead with inherent stability. The brake lines are used to adapt the speed to the flight situation in order to ensure optimum performance and safety.

With the SPHERA 2 RS, the best glide speed in calm air is achieved with the brakes fully released. In calm air, the SPHERA 2 RS achieves its minimum sink rate with the brakes slightly applied. If you pull the brakes further, the sink rate no longer decreases, the control forces increase noticeably and the pilot reaches minimum speed.

WARNING

Flying too slowly, close to stall speed, increases the risk of an unintentional one-sided or complete stall. This speed range should therefore be avoided and used only for landing.

Turning

With the SPHERA 2 RS, SWING has developed a paraglider that responds immediately to control inputs and is remarkably agile. The best performance is achieved when the SPHERA 2 RS is flown through turns with sufficient speed and weight shift. Too much brake input only increases the sink rate.

TIP

As a general rule, when turning, first shift your weight and then pull the control line. This has the following advantages:

- Longer control travel
- More direct handling
- Less sink in turns

The SPHERA 2 RS has little tendency to spin; however, the high aspect ratio and dynamics of the wing require a longer period of familiarisation for tight turns and for thermalling close to the slope. On your first flights, therefore, keep a sufficient distance from the slope and keep safety margins until you are familiar with the handling of the SPHERA 2 RS.

If the pilot shifts their weight clearly towards the braked side, the control travel is long and the glider turns tightly and precisely. It can therefore be turned even in the tightest of spaces by carefully pulling the inside brake line.

As brake line input increases, the bank angle increases and the glider flies a fast and increasingly steep turn, which eventually develops into a spiral dive (for further information, see “Spiral dive”).

Emergency steering

If the brake lines fail, e.g. because the knot on the brake handle has come undone, or if a brake line is damaged, the SPHERA 2 RS can also be steered and landed using the rear risers.

In this case, the stall occurs earlier and the pilot must compensate for the changed flight behaviour by pulling the risers gently.

Rapid descent methods

WARNING

Rapid descent methods other than those described in this section have not been tested by SWING.

SWING advises against using rapid descent methods other than those described in this section. In extreme cases, they can lead to uncontrollable flight situations.

In some flight situations, a very rapid descent is necessary to escape imminent danger, such as the lift under a cumulus cloud, an approaching cold front or developing thunderstorms.

All rapid descent methods should be practised in calm air and with sufficient height so that they can then be used effectively in extreme conditions. The rapid descent methods are divided into three different manoeuvres, which increase the sink rate in a safe and controllable way.

Spiral dive

WARNING

In a spiral dive, very high turning speeds with multiples of the acceleration due to gravity (over 6 g) can be reached. You should therefore approach this manoeuvre with caution. Please note the following:

Fly your first spiral dives as part of a safety training course under professional guidance.

Do not enter the spiral dive from a wingover. With this entry, high sink rates can be reached very quickly, which makes it impossible to control the sink rate safely.

Do not stay in the spiral dive for too long, as you may lose consciousness.

It is essential to keep **a safety height of 200 metres above the ground**. The manoeuvre must be completed by this height.

Spiral dives with “big ears” put extreme loads on the parts of the canopy that are still open. This manoeuvre is prohibited.

The spiral dive is the most effective rapid descent method and can achieve sink rates of more than 20 m/s. It is suitable when there is strong lift and little wind.

During the test flights, the SPHERA 2 RS always recovered from the spiral dive on its own with the pilot in a neutral position. It may continue turning for several revolutions before it does so.

How long it continues turning depends on the sink rate and on the harness geometry and settings.

As a general rule, the spiral dive should be exited actively and in a controlled manner. At higher sink rates, the exit may take several revolutions.

Because of the complexity and potential dangers of the spiral dive, SWING recommends learning this manoeuvre under qualified instruction. Although the g-forces on the SPHERA 2 RS are generally relatively low, they can still overwhelm untrained pilots.

TIP

During the spiral dive, the outer side of the wing may collapse, but this is of no significance. You can prevent this by applying a little brake on the outside of the turn. Release the brakes gently.

Entry

The spiral dive is entered from full speed by flying an increasingly tight turn with the pilot clearly shifting their weight to the inside of the turn (see also “Turning”).

The bank angle and sink rate are controlled by carefully pulling or releasing the inside brake line and by pulling the outside brake line slightly.

Before and during the spiral dive, always look down and constantly check your height above the ground.

Exit

DANGER

In certain conditions, it may be necessary to brake the outer half of the wing and/or shift your weight to the outside to exit the spiral dive.

In addition, the exit may take several revolutions with a corresponding loss of height. If you lose control of the glider and the sink rate, deploy your reserve parachute **immediately**!

The spiral dive can result in loads and/or impaired consciousness that make it impossible to deploy the reserve later on.

Exit the spiral dive slowly and steadily over several revolutions. To do this, bring your body weight into a neutral position and release the inside brake gradually. If the brake is released too quickly, the excess speed can cause the wing to climb up, start to pitch and collapse.

The exit can be assisted by applying a little brake on the outside of the turn. Any continued turning can be stopped by shifting your weight to the outside of the turn.

B-stall

Due to its design, a B-stall is not possible with the SPHERA 2 RS.

Big ears

Unlike most 2-liners, big ears are a simple and efficient rapid descent method with the SPHERA 2 RS.

WARNING

Big ears put a higher load on the line groups that are still bearing the load. Do not fly any extreme manoeuvres with “big ears” applied.

This manoeuvre should be avoided at low air temperatures. The pilot must be aware that the tendency to deep stall increases in these conditions.

The advantage of big ears is that the paraglider continues to fly straight ahead. This allows you to leave a dangerous area. You can even land with big ears applied, for example to compensate for the lift component when top landing.

TIP

With the SPHERA 2 RS, it is important to pull the outer A-risers down VERY FAR to make big ears and to give the ears some time to collapse.

Then adjust the depth of the collapse and the pull on the outer A-lines until the ears stay in place steadily without flapping, and push the speed bar, since the big ears increase the angle of attack.

Reducing the wing area increases the wing loading, making the wing more resistant to collapses in turbulence. However, it also increases the drag of the wing: it flies more slowly and closer to the stall point. To counteract this

and to increase the effectiveness of the descent, the speed system is usually also applied.

Entry

Big ears are entered by pulling the outer A-lines downwards. This should be done in such a way that a sufficiently large area of the outer wing collapses, so that you do not have to counteract a constant tendency to reopen.

With the SPHERA 2 RS, it is important to pull the outer A-risers down VERY FAR to make big ears and to give the ears some time to collapse.

Then adjust the depth of the collapse and the pull on the outer A-lines until the ears stay in place steadily without flapping.

Once the ears have collapsed, accelerate the glider slightly to stabilise the manoeuvre and make it more effective.

Keep hold of the brake lines while doing so. The paraglider is steered by weight shift. You can now descend safely with the stable centre section of the wing. While carrying out the manoeuvre, the brakes must not be shortened, e.g. by wrapping the brake lines.

Exit

To exit, release the speed bar, wait until the glider has slowed down and then release the A-risers swiftly. If the ears do not reopen on their own, help them to open by pumping the brakes briefly and firmly.

Landing

When landing the SPHERA 2 RS, you do not need to observe any special points, apart from its high trim speed and glide performance.

Start the landing with a straight final approach into the wind and let the paraglider glide out at trim speed. At a height of one metre, pull the control lines down to their lowest point so that the paraglider is fully braked just before touching the ground.

In strong headwinds, use the brakes in a more measured way. Avoid landing from steep turns and making quick changes of direction before landing because of the resulting pendulum movements.

⚠ WARNING

Close to the ground, always fly with sufficient speed (well above stall speed) to avoid an unintentional stall.

06 Types of Use

The SPHERA 2 RS was developed and tested solely for use as a paraglider for foot launching and winch towing. Any use other than that intended is not permitted.

Motorised flying

In Germany, motorised use of paragliders requires additional certification.

Tandem flying

The SPHERA 2 RS is not certified for tandem use.

Winch launch

At the beginning, the winch launch sequence is similar to a forward launch. Once the pilot has brought the canopy up to its highest point, the pull of the towline lifts the pilot off the ground. Never give the launch command before the glider is fully under control. Avoid strong directional corrections during the launch phase and before reaching the safety height. After the pilot has left the ground, they are towed slowly at a shallow angle up to the safety height of 50 metres. During this phase, the pilot must remain ready to run and must not sit back in the harness, so that they can land safely if the winch fails or the towline breaks. Make sure you fly the paraglider with “brakes released” so that the angle of attack is not increased further by the brakes.

During a winch launch, steer as far as possible by weight shift alone. Short, firm control inputs with the brake can assist directional corrections without braking the glider too much and stalling it.

Special regulations and training requirements apply to winch launching. They are:

- Winch towing training and towing rating for the pilot
- Tow winches and tow releases must have proof of airworthiness for towing paragliders.
- The winch operator requires training that includes towing paragliders.
- The SPHERA 2 RS must not be towed with a towline tension of more than 100 daN.

⚠ WARNING

Never tow the paraglider with a motor vehicle, motorboat or other vehicle if you do not have a suitable towing device and a suitable winch operator.

ⓘ TIP

For winch launches too, laying out the canopy in an arc helps the glider to fill and rise evenly during launch.

This considerably reduces the need for corrections during the launch phase and thus allows a controlled and safe launch.

WARNING

When webbing releases are used, there is an increased risk of lockout, in which the aircraft does not fly towards the winch and the pilot's control forces are not sufficient to correct this. During the tow, you should regularly check the position and alignment of the glider relative to the pilot, as the towline attachment point, which lies far in front of the pilot, makes it easier for the glider to turn away from the pilot unnoticed.

Attaching the tow release

The towline should pull as close as possible to the centre of gravity of the system. On a paraglider, the ideal towing point is at the level of the harness suspension points, or directly on the risers.

Using a suitable towing aid is not mandatory, but it is definitely advisable, as it gives the pilot greater safety margins during the tow phase.

PLEASE NOTE

SWING recommends using a suitable towing aid, as it gives the pilot greater safety margins during the tow phase.

SWING offers the adjustable "Pro-Tow" towing aid as an option. It makes the tow easier during the launch phase and slightly pre-accelerates the canopy during this phase.

WARNING

When using spreader bar releases, the distance between the release and the shackle should be sufficiently extended (with accessory cord or webbing), and the release must be secured against flicking back with a hold-down elastic.

Using the tow release attachment must not reduce the distance between the risers (risk of twisting).

WARNING

If you are towing with a front container, make sure before the first launch that the reserve parachute can be deployed without obstruction at all times. If this is not the case, you may only be towed with a suitable webbing release.

Aerobatics

In Germany, aerobatics with a paraglider are prohibited. Aerobatics are defined as flight attitudes with a bank or pitch angle of more than 135 degrees about the lateral or longitudinal axis.

The SPHERA 2 RS was not developed or tested for aerobatics.

WARNING

All forms of aerobatic manoeuvres are illegal with the SPHERA 2 RS. Pilots who attempt them put their lives at risk. Performing them involves the risk of unpredictable flight attitudes that can lead to material damage and structural failure.

07 Dangerous Situations and Extreme Flying

Dangerous situations

⚠ WARNING

Always stay within the operating limits. Under all circumstances, avoid aerobatic manoeuvres and extreme loads such as spiral dives with “big ears”. This helps to prevent accidents and avoids overloading the structure of the paraglider.

In turbulent conditions, always keep a sufficient distance from cliffs and other obstacles. You need time and enough height to recover from extreme situations.

If the corrections described in the individual sections do not bring the glider back into controlled flight, or if there is not enough height for a correction, deploy your reserve parachute.

As a result of pilot errors, extreme wind conditions and turbulence that the pilot does not recognise in time, the paraglider can enter an abnormal flight condition that requires special reactions and skills from the pilot.

The proven best way to learn to react calmly and correctly in an emergency is to attend a safety training course. There, you learn to master extreme flight attitudes under professional guidance.

Another safe and effective way to become familiar with the reactions of your paraglider is ground handling practice. It allows you to practise launching as well as smaller flight manoeuvres (stall, asymmetric collapse, front stall and others).

Any pilot who flies in turbulence or makes a mistake when controlling the paraglider runs the risk of entering an extreme flight condition. All the extreme manoeuvres and flight conditions described here are dangerous if they are carried out without adequate knowledge, without sufficient safety height or without instruction.

Please note that all the manoeuvres described in this Manual were carried out during type certification with a harness of the following dimensions:

Total flying weight	Width (A)	Height (B)
< 80 kg	(40±2) cm	(40±1) cm
80– 100 kg	(44±2) cm	(42±1) cm
> 100 kg	(48±2) cm	(44±1) cm

If harnesses other than those used for type certification are used, flight behaviour may differ from the descriptions in this Manual.

Safety training

WARNING

This Manual is no substitute for safety training. We therefore recommend that you take part in a dedicated safety training course in which you learn how to deal with extreme situations.

The aim of a safety training course is to become familiar, under guidance, with your equipment and with the correct reactions in extreme situations.

The extreme situations are induced deliberately. The manoeuvres and how to enter and exit them are described in the training plan.

How the manoeuvres actually develop depends on many factors, such as the type and intensity of the input, the seated position during and after the input, or the model and geometry of the harness used. The flight conditions and manoeuvres induced during training often differ considerably from one another. They are not comparable with the manoeuvres flown during type certification.

Nevertheless, taking part in a safety training course is generally recommended, because its purpose is not to verify the classification of the paraglider but to train your own ability to deal with extreme flight conditions, regardless of how closely the induced disturbance matches the standard.

Special considerations

Briefing

If you want to attend a safety training course with the SPHERA 2 RS, we strongly recommend that you first receive a briefing on the specific flight behaviour and the structural loads of a 2 – liner.

Experience

The SPHERA 2 RS is optimised for competition flying and is aimed exclusively at professional pilots who can demonstrate above-average experience in safety training. The SPHERA 2 RS is in no way suitable for gaining first experience in safety training.

Folding lines

Special folding lines were used for the type certification of the SPHERA 2 RS (see also the section “Folding lines”). Without these folding lines, induced collapses and front stalls may deviate from the EN-D guidelines.

Material stress and damage

Safety training always places extreme stress on the material.

SWING advises against subjecting the material of the SPHERA 2 RS to excessive strain during safety training.

During safety training, uncontrolled flight conditions may occur that lie outside the operating limits of the paraglider and can overload the equipment.

Changes in the trim of the line lengths and canopy material after a safety training course can lead to a general deterioration in flight characteristics.

As a general rule, damage resulting from safety training is excluded from the warranty.

Safety training and RAST

⚠ WARNING

Do not pitch or roll the glider to induce a larger collapse.

A collapse provoked from a rolling or pitching movement can lead to uncontrolled flight conditions. Such collapses are unrealistic and have no training value.

With the SPHERA 2 RS, most safety training manoeuvres can be practised in the same way as with a glider without RAST.

Only manoeuvres in which the glider is actively collapsed (asymmetric collapse, frontal collapse) usually require higher forces to induce than would be necessary with a glider without RAST, because RAST has to be overcome. This usually results in a wide variation in the depth and line of the collapse.

Collapsing the paraglider

Asymmetric collapse

Asymmetric collapses are caused by the stagnation point moving along the leading edge of the glider. A negative angle of attack causes part of the canopy to collapse and fold under, and the paraglider may surge, turn away or go into a fast rotation.

Exit

After an asymmetric collapse, the turning movement must be controlled and the wing stabilised by applying measured brake on the intact side until the paraglider flies straight again. With large collapses, counter-steer with great sensitivity so that the airflow over the glider does not separate completely and the manoeuvre does not turn into a full stall.

⚠ WARNING

Counter-steering too hard on the intact side can lead to a stall and therefore to further uncontrolled manoeuvres (cascade).

The collapsed part of the wing usually reopens on its own. Reopening can be assisted by applying measured brake (no hectic “pumping”) on the collapsed side while counter-steering on the open side. Use the full brake travel to do so.

After very large-area collapses of more than 70%, cravats, in which the wingtip of the collapsed side becomes caught in the lines, cannot be ruled out.

Our tests have shown that the SPHERA 2 RS can be kept in straight flight surprisingly well even with larger cravats by counter-braking and shifting weight towards the open side. Most cravats can be cleared by pulling firmly on the stabilo line.

Front stall

Collapses of the central part of the leading edge are also caused by a negative angle of attack.

Exit

The SPHERA 2 RS normally recovers from a front stall quickly and on its own. Applying a little brake symmetrically on both sides can assist reopening. In extreme front stalls across the entire chord, the wingtips can move forward so that the glider forms a U-shape. Recovery is also achieved by applying a little brake symmetrically on both sides, making sure that both wingtips return evenly to the normal flight position.

Types of stall

WARNING

Full stalls and spins are flight manoeuvres that are life-threatening if the recovery is incorrect. These manoeuvres should therefore be avoided. Instead, it is important to recognise the onset of a stall so that the pilot can prevent it by reacting immediately.

The airflow around the paraglider always forms a laminar and a turbulent boundary layer zone. Extremely dangerous flight conditions can occur if the laminar boundary layer separates, causing practically the entire airflow over the upper surface of the wing to break away, which is mainly the case at very high angles of attack.

A distinction is made between the following three types of stall on paragliders.

Spin

A spin is a stable flight condition in which one side of the paraglider is stalled while the other side continues to generate lift. The paraglider rotates around the stalled side of the wing.

Exit

To stop the spin, the pilot must release the brake that is being held down swiftly. This allows the stalled side of the wing to pick up speed again. Depending on how the recovery is made and on the dynamics of the rotation, the canopy may surge forward on one side and collapse asymmetrically.

If the pilot notices that they have entered a spin unintentionally, they should immediately release the brake that has been pulled too far.

WARNING

If the spin does not stop, check that the brakes are fully released!

Full stall

In a full stall, the lift-generating circulation around the paraglider breaks down completely or almost completely. It is triggered when the maximum possible angle of attack of the profile is exceeded. The most common cause is flying below minimum speed, or flying close to minimum speed in combination with turbulence.

In a full stall, the paraglider loses its forward speed, drops back and deflates. If the brakes are held down, the wing comes back over the pilot. This is followed by an almost vertical descent at a sink rate of approximately 8 m/s.

⚠ WARNING

If the paraglider drops back in a full stall, it is essential to keep the brakes held down. Otherwise, the canopy can surge forward very strongly, in extreme cases even below the pilot. Keep the brakes held down until the wing is above you again.

Exit

Release the brakes completely within three seconds (count 21, 22, 23). If you release the brakes too slowly, the glider can go into a spin. The spin stops on its own once the brakes are fully released.

Deep stall

Paragliders can enter a deep stall for various reasons: brake lines set too short (without free travel), aged or damaged and therefore more porous sailcloth, altered trim or line lengths, and changes in the profile characteristics caused by moisture (flying through rain showers). Paragliders are particularly prone to deep stall if the wing loading is too low.

In a deep stall, the airflow from the front decreases and the glider enters a stable flight condition without forward speed. The paraglider sinks almost vertically at 4 to 5 m/s and the wind noise decreases noticeably.

Exit

Sitting upright, push the A- and B-risers forward in the direction of flight with your arms extended, thereby shortening them by five to ten centimetres.

If you have the speed system connected, you can also increase the speed with the speed bar so that the glider returns from the deep stall to a normal flight attitude.

After landing, it is essential to have the glider and the line lengths checked.

Further warnings

Deep stall in rain

In general, there are two different reasons why a paraglider can enter a deep stall in rain:

Case 1: On longer flights in rain, the canopy can absorb water and become heavier. This shifts the centre of gravity and the angle of attack. As a result, the airflow over the paraglider can separate.

Case 2: When it starts to rain, water droplets collect on the top surface of a paraglider without forming a continuous film of water.

The droplets make the surface so rough that the airflow separates. The shape and distribution of the droplets depend on the coating and the age of the sailcloth.

In both cases, the closer a glider is to the deep stall limit due to its design and age, the less water it needs to absorb to enter a deep stall.

The control and brake travel shortens considerably, and the deep stall is then usually triggered by a change in brake input or angle of attack, e.g. caused by a gust or a thermal releasing.

WARNING

When flying in extremely humid air or in rain, you are outside the operating limits of the paraglider.

If flying in rain cannot be avoided, observe the following:

- It is advisable to fly slightly accelerated (at least 30% or more) during and after the rain.
- Use no brake or only very little brake if possible
- Do not apply big ears
- The control travel becomes shorter
- Avoid tight turns, especially on final approach. If conditions allow, you should also fly slightly accelerated during this phase of flight.
- Avoid high angles of attack and a possible premature stall close to the ground (release the speed bar only slowly)

Temperature range

Extreme temperatures can affect the air density and therefore the flight behaviour of the paraglider. Be aware of this, especially at very low temperatures, and observe the relevant advice for the individual manoeuvres.

As a general rule, operating temperatures below -10°C should be avoided.

Advertising and stickers

Before applying advertising, make sure that the sticker to be applied does not change the flight characteristics. If in doubt, you should refrain from applying advertising.

PLEASE NOTE

Applying large, heavy or unsuitable stickers to the glider may invalidate the certification.

Overloading

High loads on the glider structure occur mainly during extreme flight manoeuvres, rapid descent methods (spiral dive) or prohibited aerobatic manoeuvres. They accelerate the ageing of the structure considerably and should therefore be avoided.

If the pilot has subjected a glider to more than normal stress, the paraglider must undergo an inspection ahead of schedule.

08 Storage and Care

Storage

Storage and transport

Even if your glider was completely dry when you packed it after the last flight of the season, for long-term storage you should take it out of the stuff sack if possible and spread the canopy out a little in a clean, dry place protected from light. If you do not have the space, open the stuff sack, inner bag and compression strap as far as possible and avoid compressing the paraglider heavily during storage. The long-term storage temperature must be between 10° and 25° C with a relative humidity between 50 and 75%. Also make sure that animals such as mice or cats do not use the paraglider as a place to sleep during long-term storage.

There should be no chemical substances in the immediate vicinity of the paraglider. Petrol, for example, dissolves the fabric and can seriously damage your glider. In the car boot, stow your stuff sack as far away as possible from spare fuel cans or oil containers.

The SPHERA 2 RS should not be exposed to extreme heat (e.g. in the boot of a car in summer). Especially in combination with moisture, high temperatures accelerate the ageing of the fibres and coating. Do not store your glider near radiators or other heat sources either.

Always transport your paraglider in the inner bag supplied with it, and use a stuff sack for the complete equipment.

Packing

The SPHERA 2 RS is equipped with flexible, kink-resistant reinforcements in the nose area and in the top surface and can be packed using all common packing methods. However, we recommend packing the SPHERA 2 RS “cell to cell” as shown in Figures 1 to 4. A second person to help makes this method easier.

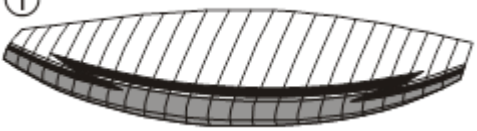
The nose reinforcements at the front are laid on top of each other to prevent kinks and deformation. This packing method helps to treat the leading edge gently. This increases the lifespan, performance and launch behaviour of the paraglider.

Steps ①-④ show how to pack the SPHERA 2 RS correctly and gently.

PLEASE NOTE

Make sure that the profile reinforcements lie flat and are not kinked by strapping them too tightly.

①



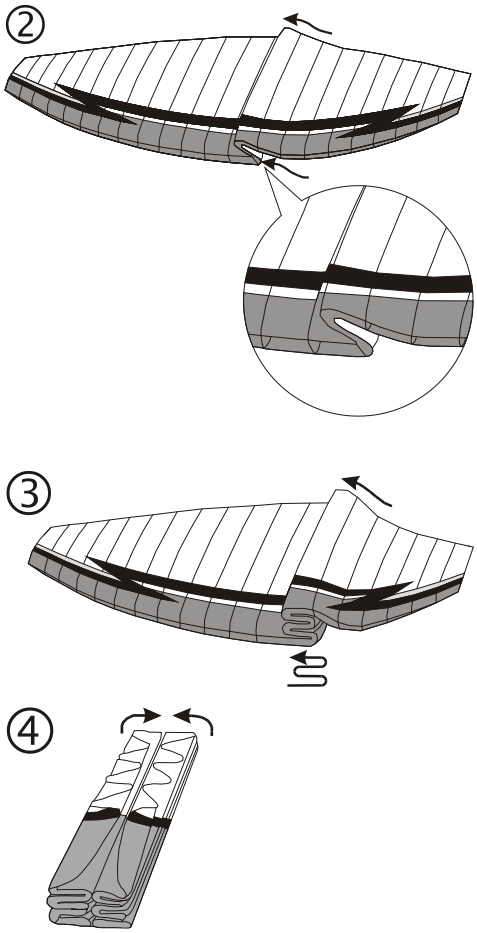


Fig. 5. Sequence for packing the SPHERA 2 RS

Vary the last step ④ of the packing process slightly so that the centre cell is not always the one that is folded. From time to time, use the neighbouring cells as well to extend the life of the sailcloth, particularly in the centre section.

For the final folding, it is advisable to place the inner bag supplied under the glider to minimise abrasion on the ground.

Care

Handle with care

The lifespan of your paraglider depends largely on how you handle the material.

The SPHERA 2 RS has a weight-optimised construction, with heavy, robust fabrics on the nose and light fabrics for the top and bottom surfaces. The materials used are dimensioned so that they retain their properties for many years and flying hours if treated with care.

To enjoy your SPHERA 2 RS for a long time, please follow the care instructions and treat your SPHERA 2 RS with care.

PLEASE NOTE

Never drag the glider over the ground. Pointed and sharp objects such as stones or branches can damage the sailcloth and the lines! Bear this in mind when choosing your launch site as well.

Sailcloth

For the SPHERA 2 RS, SWING uses a specially developed polyamide sailcloth with a high-quality coating for improved UV resistance, colourfastness and air impermeability. This sailcloth is subject to the strictest laboratory testing and was tested for several months under extreme conditions in demanding flight operations.

Care is essential to guarantee the durability of these fabrics and of your wing and to ensure that they retain their properties. Protect your wing from unnecessary UV radiation. Only unpack your SPHERA 2 RS immediately before launch and pack it away again immediately after landing. Although modern paraglider fabrics

are increasingly well protected against the effects of sunlight, UV radiation in particular is still one of the decisive factors in the ageing of the sailcloth. First the colours fade, then the coating and the fibres begin to age.

During the manufacture of the SPHERA 2 RS, the coated side of the sailcloth is placed on the inside. This gives the coating, which is decisive for the properties of the sailcloth, relatively good protection against mechanical damage. Nevertheless, when choosing a launch site, you should select ground that is free of sharp-edged and protruding objects wherever possible.

Do not step on the glider. Treading on it weakens the fabric, especially on hard and stony ground. At the launch site, also keep an eye on spectators, especially children: do not hesitate to point out how delicate the sailcloth is.

When packing the paraglider, please make sure that there are no insects inside the canopy. Some species produce acids as they decompose, which can eat holes into the sailcloth. Grasshoppers bite through the sailcloth with their mouthparts, creating holes. They also secrete a dark, heavily staining fluid. Chase the insects away before folding the glider.

A brand-new glider is often heavily compressed on delivery. This compression is only for the initial shipment and should not be repeated afterwards. So do not pack your glider too tightly after use. And even if it is very comfortable, avoid sitting on the stuff sack containing your glider.

Lines

PLEASE NOTE

Dyneema lines, such as those used for the main brake line, are very sensitive to temperature and can be permanently damaged at temperatures above 75° C. You should therefore never store your glider in the car in high summer.

The SPHERA 2 RS is equipped with various high-quality, precisely manufactured lines that were selected to suit the respective loads and areas of use. Like the sailcloth, lines lose strength mainly as a result of UV radiation. The same rule applies here: protect your lines from unnecessary UV radiation.

Especially during ground handling with crossed risers, make sure that the sheath of the lines is not worn through by friction.

Once the glider has been laid out, do not step on the lines and watch out for spectators or skiers who may accidentally walk over your lines.

When packing, avoid unnecessary kinking of the lines, and only use the knots described for the brake knots.

WARNING

It is essential to observe the line maintenance intervals specified in the Maintenance and Service Book.

Improper handling and neglected maintenance intervals create a risk of line failure.

Dampness / moisture

If the glider has become damp or wet, it should be dried as quickly as possible in a well-ventilated place (but never in the sun). As the fibres of the sailcloth absorb the water, it can take several days for the canopy to dry completely. If the paraglider is left packed while damp, mould can form and, especially in warm conditions, the fibres can decompose. As a result, the paraglider can become unairworthy within a short time. Wet gliders that freeze can likewise become unairworthy within a short time.

Contact with salt water

If the paraglider has come into contact with salt water, it must be rinsed thoroughly with fresh water immediately (before it dries). It must then be dried in a well-ventilated place (but never in the sun).

If the paraglider is not rinsed thoroughly, this can cause permanent damage to the material.

Sand and salty air

In many cases, sand and salty air cause the line and sailcloth material to age considerably faster.

In this case, the glider must be sent in for inspection ahead of schedule.

Cleaning

Ideally, use only lukewarm fresh water and a soft sponge for cleaning. For stubborn dirt, a mild detergent is recommended, which must then be rinsed out carefully and thoroughly. Then leave your glider to dry in a shady, well-ventilated place.

PLEASE NOTE

Never use chemicals, brushes, hard sponges, let alone a washing machine, pressure washer or steam cleaner to clean the glider, as these can damage the coating and the strength of the sailcloth. The wing becomes porous and loses tear strength.

09 Repairs, Inspections and Warranty

Type designation

SWING paragliders have an information label on the centre rib

For any questions to your SWING dealer or when ordering spare parts and accessories, it is helpful to be able to state the type designation and serial number of the paraglider so that it can be clearly identified.

Spare parts

As a general rule, only original spare parts may be used for maintenance and repair.

Spare parts such as lines, risers and the associated hardware, brake handles and self-adhesive repair material can be obtained either directly from SWING or from your SWING dealer.

Repair material, in particular for sewing work on the canopy, is available from SWING exclusively for SWING workshops.

Repairs

Small repairs to the glider

You can repair small tears in the wing with self-adhesive sailcloth, provided they are in areas under little load, not directly on seams and no larger than 3 centimetres.

Individual lines for your SPHERA 2 RS can be ordered directly online at:

info@swing.de

Line groups must be replaced by a SWING workshop.

Check the trim of your SPHERA 2 RS after every line replacement.

SWING workshops

Always have maintenance and repair work carried out directly by SWING or by a contract workshop approved by SWING. SWING workshops have trained staff, original SWING spare parts and the necessary expertise – a guarantee of the highest quality.

Regular checks

Check the following components and materials at regular intervals, e.g. after a landing, for damage, wear and correct function:

- Risers with quick links
- Lines
- Sailcloth

Lines

The lines have a major influence on flight behaviour. Correct line lengths and symmetry are also important for performance and handling. Measuring the line lengths is part of the regular glider check. The lines must be loaded with five kg to ensure reproducible results for comparison with the lengths on the check sheet. The line lengths of the SPHERA 2 RS are given in the Maintenance and Service Book.

SWING recommends checking the lines regularly after one year or 50 flying hours. To check the trim, it is sufficient to check only the main lines.

PLEASE NOTE

Environmental influences such as high temperatures or moisture can affect line lengths.

Check the line lengths at regular intervals, especially if launch or flight behaviour changes.

After a water landing or if the lines have become soaked, the line lengths must be checked.

The main lines are subject to the greatest changes because they are very long in relation to the cascade lines and carry high loads. On the SPHERA 2 RS, all main lines in a group (AI, BI is the first, AII, BII the second and AIII, BIII the third group) must be the same length. The maximum difference between the individual line lengths is 5mm. If the difference is greater, please send your glider to SWING or to a contract workshop approved by SWING for a check and trim correction.

WARNING

A damaged line can lead to loss of control of the paraglider. Always replace damaged lines.

Only use original parts for replacement.

Lines lose strength and age even if the paraglider is used rarely or not at all. This can impair the function and safety of your paraglider. Signs of wear are slight bumps or fraying. In this case, the lines must be replaced immediately.

WARNING

Never use knots to shorten the lines. Knots weaken the lines considerably and can cause them to break under high load.

Knots are only permitted for the connection between the main brake line and the brake handle, using the knots described.

Inspection

General

To ensure that your paraglider continues to offer the same high level of operational safety and reliability in the future, you should follow the SWING service programme in the Maintenance and Service Book.

Failure to observe the inspection intervals invalidates the warranty and the certification. A properly kept logbook recording all flying and training hours helps you to identify the deadlines in good time.

Detailed information on the inspection can be found in the two supplementary brochures “Paraglider Inspection Information” and “Maintenance and Service Book”, both of which form part of this Manual.

Both brochures can be downloaded from the SWING website at:

https://www.swing.de/produkte/sphera-2-rs/?lang=en

Inspection intervals

The following inspection intervals apply to the SPHERA 2 RS:

- An inspection must be carried out at least every 2 years, counting from the date of purchase for the first inspection.
- If 150 operating hours (including ground handling) are reached before the above intervals expire, the paraglider must undergo an inspection ahead of schedule.

Due to the increased wear on the canopy, time spent ground handling must be multiplied by a factor of 2 when adding it to the total operating hours of the paraglider.

Authorisation to inspect

It is very important that you have your paraglider serviced at the prescribed intervals throughout its entire lifespan.

Inspection by the manufacturer

Due to the complexity of the SPHERA 2 RS, the inspection must be carried out by the manufacturer or importer.

Inspection by the owner

Under § 14 (5) LuftGerPV, the owner may inspect the glider themselves or commission a third party (e.g. manufacturer / importer) to carry out the inspection.

If the owner carries out the inspection, the liability and warranty of SWING Flugsportgeräte GmbH become void.

Warranty

The SWING warranty is a comprehensive service package that meets high standards of customer service and support. You can read about the scope of the warranty on our website under www.SWING.de → Service → Warranty where all the details are set out.

https://www.swing.de/garantie/?lang=en

To benefit from your SWING warranty, you must

- have your paraglider checked by SWING or your SWING importer
- provide clearly identifiable documentation and results of the inspection from the authorised inspector (date and place / name of the inspector) and have them entered near the information label.

Complaints about defects in the product, deviations or changes in flight characteristics and any warranty claims must be reported to the manufacturer immediately. Depending on the warranty claim, it may be necessary to send the paraglider or other SWING products to SWING Flugsportgeräte GmbH for inspection.

10 SWING on the World Wide Web

SWING website

SWING offers a comprehensive range of information on the World Wide Web about your SPHERA 2 RS and many other paragliding topics. The SWING website is the first port of call for the worldwide SWING community:

www.SWING.de

On the SWING website, in addition to further information and accessories for your SPHERA 2 RS, you will find a wide range of accessories for your paraglider and useful products for pilots.

You will also find all the links to our services and pages on the World Wide Web there:

- Service
- Accessories

This website and its contents are made available to you for your use. The contents of the SWING World Wide Web pages are provided in their current form and condition. SWING reserves the right to change the pages or block access to them at any time.

We wish you lots of fun and many great flights with your SPHERA 2 RS!

Your
SWING Team

Appendix

Addresses

DHV

Deutscher Hängegleiterverband e.V.
Am Hoffeld 4 (street address)
PO Box 88 (postal address)
83701 Gmund am Tegernsee
Germany
Phone: +49 (0) 8022 9675 - 0
Fax: +49 (0) 8022 9675 - 99
Email: dhv@dhv.de
www.dhv.de

SWING Flugsportgeräte GmbH

An der Leiten 4
82290 Landsberied
Germany
Phone: +49 (0) 8141 3277 - 888
Email: info@SWING.de
www.SWING.de

Address for gliders sent for recycling

SWING Flugsportgeräte GmbH
- Recycling Service -
An der Leiten 4
82290 Landsberied
Germany

Glider details

Model:	Size:	Colour:	Serial number:
SPHERA 2 RS			__/__/-__/__/__/ - __/__/__/__/__/
Test-flown on: __/__/ - __/__/ 20__ Dealer stamp and signature: _____			

Inspections and repairs carried out

Date:	Work carried out:	Overall condition on delivery:	Carried out by (name):	Stamp, signature

Notes

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by SWING

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