



OWNER'S  
MANUAL  
ARCUS 2<sup>RS</sup>



**INFORMATION**

SWING Flugsportgeräte GmbH reserves the right to alter or add to the contents of this Manual at any time. You should therefore regularly visit our website:

**[www.SWING.de](http://www.SWING.de)**

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Dear ARCUS 2<sup>RS</sup> pilot

THANK YOU FOR PURCHASING A SWING PRODUCT!

This Instruction Manual is an important part of your paragliding equipment. It contains instructions, important advice on safety and paraglider care and maintenance, along with tips on flying technique and general information about the sport of paragliding.

It is essential that you read this Manual thoroughly before your first flight.

We hope that flying the ARCUS 2 RS will bring you many years of enjoyment. The innovative design, first-rate materials and high quality workmanship of your paraglider set it apart from others. Your SWING paraglider was developed to comply with all of the current safety and certification requirements in Germany.

To enhance your flying enjoyment further, we recommend that you familiarise yourself with the information and instructions contained in this Manual regarding safety, equipment and service.

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

We hope that you have a great time flying the ARCUS 2 RS - and “happy landings”!

SWING Team

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



## **WARNING**

Read this Manual before using your paraglider!

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# 01 Introduction

## Manual

SWING requires you to familiarise yourself with your new paraglider by reading this Manual before your first flight. This will allow you to acquaint yourself with its new functions and learn the best way to fly the paraglider in various situations. It will also explain how to get the most out of your paraglider.

Information in this manual on design of the paraglider, technical data and illustrations are subjects to change. We reserve the right to make changes without prior notification.

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

The Manual complies with the airworthiness requirements in LTF NFL II 91/09 and forms part of the certification.

There are a total of three parts to the Manual, which give the following information:

1. Manual (this document):  
Instructions on getting started and using the paraglider
2. Maintenance and Service Book (PDF/Download):  
Technical data and inspection information specific to the particular glider
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 a situation where there is **imminent** danger, which in all probability **will lead to death or serious injury**, if the instructions given are not followed.



### WARNING

Sections of text headed “Warning” indicate a potentially dangerous situation, which **may lead to death or serious injury**, if the instructions are not followed.



### CAUTION

Sections of text headed “Caution” indicate a potentially dangerous situation, which may lead to **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 which will make it easier to use your paraglider.

## Series of instructions

In this Manual, instructions which must be followed in a certain order are numbered consecutively.

< 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 is not relevant.

## Lists of parts

Numbers circled in red (❶) refer to various parts of the item pictured. A list of the numbers and the name of the part labelled follows the picture.

## Bullet points

Bullet points are used in the Manual for lists.

Example:

- risers
- lines

## QR-Codes



There are QR Codes in various sections of this Manual, which take you to the links given in the corresponding text.

## SWING Flugsportgeräte and the environment

Protection of the environment, safety and quality are the three core values of SWING Flugsportgeräte GmbH and they have implications for everything we do. We also believe that our customers share our environmental awareness.

## Respect for nature and the environment

You can easily play a part in protecting the environment by practising our sport in such a way that there is no damage to nature and the areas in which we fly. Keep to marked trails, take your rubbish away with you, refrain from making unnecessary noise and respect the sensitive biological equilibrium of nature. Consideration for nature is required even at the launch site!

Smokers – please do not leave any cigarette butts, matches etc. at flying sites.

Paragliding is, of course, an outdoor sport – protect and preserve our planet's resources.

## Environmentally-friendly recycling

SWING gives consideration to the entire life cycle of its paragliders, the final stage of which is recycling in an environmentally-friendly manner. The synthetic materials used in a paraglider must be disposed of properly. If you are not able to arrange appropriate disposal, SWING will be happy to recycle the paraglider for you. Send the glider with a short note to this effect to the address given in the Appendix.

## 02 Safety



### WARNING

It is imperative that the instructions contained in this Manual are followed at all times.

Failure to do so renders invalid the glider's certification and/or results in loss of insurance cover. Furthermore, it could lead to serious injuries or even death.

This applies in particular, but not only, to the instructions given in the sections Safety, Flying the ARCUS 2 RS, Types of Use and Dangerous Situations and Extreme Flying.

### Safety advice

All forms of aerial sport involve certain risks. When compared with other types of aerial sport, paragliding has the lowest number of fatal accidents measured according to the number of licensed pilots.

However, few other sports demand such a high level of individual responsibility as paragliding. Prudence and risk-awareness are basic requirements for the safe practice of the sport, for the very reason that it is so easy to learn and practically anyone can do so. Carelessness and overestimating one's own abilities can quickly lead to critical situations. A reliable assessment of conditions for flying is particularly important. Most serious paraglider accidents are caused by pilots misjudging the weather for flying.

In Germany, paragliders are subject to the guidelines for air sports equipment and must not under any circumstances be flown without a valid certification. Independent experimentation is strictly prohibited. This Manual does

not replace the need to attend training at a paragliding school.

A specialist must test-fly and inspect the paraglider before your first flight. The test-flight must be recorded on the paraglider information label.

Carry out your first flight with the paraglider on a training slope. For this flight and for all other flights, you must wear an approved harness, reserve parachute, harness, helmet, gloves, firm shoes with ankle-support and suitable clothing. Only fly if the wind direction, wind speed and current and forecasted weather conditions guarantee a safe flight.

The Manual must be passed on to any new owner if the paraglider is sold. It is part of the certification and belongs with the paraglider.

The ARCUS 2 RS was developed and tested solely for use as a paraglider for foot-launch and winch-towing. Any use other than as intended is not permitted. Do not under any circumstances use the paraglider as a parachute. Acrobatics are not permitted.

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

### Safety notices

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



### WARNING

The paraglider owner is responsible for carrying out the action required by the safety notice.

The notices contain instructions on how to inspect the gliders concerned

for possible faults and the steps required to rectify any faults.

SWING publishes on its website any technical safety notices and airworthiness instructions which are issued in respect of SWING products.



Safety notices are released by the certification agencies and are also published on the relevant websites. You should therefore visit the safety

pages of the certification agencies on a regular basis and keep up-to-date with new safety notices which cover any products relating to paragliding (refer to Appendix for addresses).

Services such as RSS are also available which allow internet users to follow various websites and changes to them without having to access them individually. This allows much more information to be followed than was previously the case.

## Disclaimer and exclusion of liability, Operating limits

Use of the paraglider is at the pilot's own risk!

The manufacturer cannot be held liable for any personal injury or material damage which arises in connection with SWING paragliders. The certification and warranty shall be rendered invalid if there are changes of any kind (incl. paraglider design or changes to the brake lines beyond the permissible tolerance levels) or incorrect repairs to the glider, or if any inspections are missed (annual and 2-yearly check).

Pilots are responsible for their own safety and must ensure that the airworthiness of the glider is checked prior to every flight. The pilot should launch only if the paraglider is

airworthy. In addition, when flying outside of Germany, pilots must observe the relevant regulations in each country.

The glider may only be used if the pilot has a licence which is valid for the area or is flying under the supervision of an approved flying instructor. There is no liability on the part of third parties, in particular the manufacturer and the dealer.

### Intended use

The ARCUS 2 RS has solely to be used as "light aerial sports equipment" with an empty weight of less than 120 kg, category paraglider.

### Disclaimer and exclusion of liability

In terms of the warranty and guarantee conditions, the paraglider may not be flown if any of the following situations exists:

- the inspection period has expired, or the inspection has been carried out by an unauthorised inspector
- pilot has insufficient experience or training
- the pilot has incorrect or inadequate equipment (reserve, protection, helmet etc.)
- the glider is used for winch-launching with a winch which has not been inspected or by non-licensed pilots and/or winch operators

## Operating limits



### WARNING

The operating limits must be observed throughout the entire flight.

When planning your flight, pay attention to current and forecasted weather conditions and temperature. Bear in mind too that the temperature will drop as the altitude increases.

The paraglider may only be used within the operating limits. These have been exceeded if any of the following situations exists:

- the take-off weight is not within the permissible weight range
- the glider is used by more than one person
- the glider is flown in rain or drizzle, cloud, fog and/or snow
- the canopy is wet
- there are turbulent weather conditions and/or wind speeds on launch higher than 2/3 of the maximum flyable airspeed of the glider (based on take-off weight)
- the air temperature is below -30°C or above 50°C
- the glider is used for aerobatics/extreme flying or flight manoeuvres at an angle greater than 135°
- there have been modifications to the canopy, lines or risers which have not been approved

## Glider categories and guidelines



### WARNING

The descriptions of flight characteristics contained in this Manual are all based on experiences from the test flights, which were carried out under standardised conditions.

The classification is merely a description of the reactions to these standard tests.

The complexity of the system paraglider - harness means that it is not possible to give any more than a partial description of the glider's flight behaviour and reactions to disturbances. Even a small alteration in individual parameters can result in flight behaviour which is markedly modified and different from the description given.

The German Hanggliding and Paragliding Association (DHV) and its safety division have developed guidelines which are based on many years of analysing paraglider accidents and on the experience of flying schools, flying instructors and safety officers. These guidelines should help pilots to select the appropriate glider classification for their particular level of flying ability. The information below relates to the classification in EN/LTF certification. There is also further information on the website of the relevant licensing body.

## **EN/LTF certification**

The ARCUS 2 RS received B classification in the final classification by the licensing body.

### Description of flight characteristics

Class B:

Paragliders with good passive safety and forgiving flying characteristics. Gliders with some resistance to departures from normal flight.

### Description of pilot skills required

For all pilots including pilots under instruction.

The pilot should already have basic knowledge of how to use a paraglider.

## **Target group and recommended flying experience**

Ambitious pilots wanting to move up to a B-class wing will feel just as comfortable flying the ARCUS 2 RS as pilots who have held their licence for many years or those who are stepping back from higher categories, and who place importance on a high level of passive safety along with good performance data.

## **Suitability for training**

The ARCUS 2 RS is not suitable for use as a training glider.

# 03 Technical Description

## General layout illustration

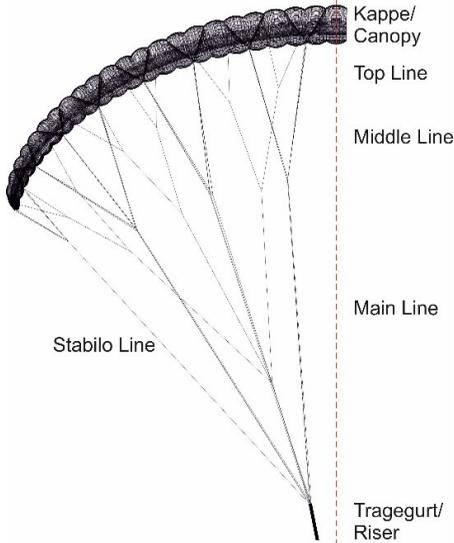


Fig.1 CAD drawing of ARCUS 2 RS

## ARCUS 2 RS ...experience your next level!

Our goal when we developed the ARCUS 2 RS was for pilots to be able to take their flying to a new level but not push themselves too far.

The ARCUS 2 RS is essentially based on the NYOS RS, which has been very successful and has proved itself in practice. We completely reworked the design, with great attention to detail, giving it a slightly lower aspect ratio and using a different combination of hard-wearing materials. This has adapted it to suit pilots who feel most comfortable with a mid-range B wing. With 57 cells, even the appearance of this elegant wing gives an indication of its performance level. The solid feeling

during flight immediately gives you a sense of familiarity with a high feel-good factor and promises pure flying enjoyment.

After just your first few turns in a warm thermal, you will sense that the ARCUS 2 RS features the characteristics of its big brother, the NYOS RS. Its extremely precise and direct handling makes it fun to ascend, and then the ARCUS 2 RS really demonstrates its performance potential in a valley crossing. Its stable canopy and optimised RAST system will give you the confidence to try something new and to fly further than ever before.

### RAST



The ARCUS 2 RS features Swing's unique Ram Air Section Technology, known as 'RAST' for short.

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

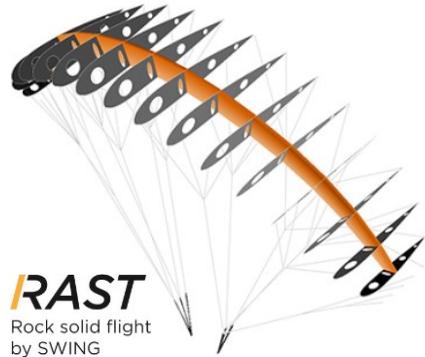


Fig. 2 Sketch RAST

Defined openings regulate the inflowing and outflowing air in such a way that they can influence the way the canopy fills (when launching) and also how it empties (in the event of canopy stability problems).

### Inflation behaviour

RAST slows down the inflowing air when the paraglider is inflating. The front part of the profile which is relevant for flow thus takes shape much more quickly and the glider immediately begins to rise up from the ground. The back part of the canopy is filled with air only slowly during the subsequent stage of inflation, which results in very harmonious and smooth launch behaviour without any tendency to overshoot or launch the pilot unintentionally.

### Flight behaviour

It is in turbulent air that RAST really puts its strengths into play, effectively stabilising the canopy and gently calming turbulent air.

This makes the ARCUS 2 RS extremely stable and forgiving, which results in noticeably improved precision and comfort during flight, and consequently also more control and better performance for the pilot.

### Collapse behaviour

If there are any stability problems, RAST prevents the canopy from suddenly and/or completely emptying because the air is not able to escape as quickly from the rear section.

A paraglider equipped with the RAST system empties more slowly, has less tendency to turn and opens more quickly.

This means that there is much less loss of height than for the same design without RAST.

However, it allows a sufficiently large area of the glider to collapse to dampen and dissipate energy.

With RAST technology, collapses more than 50% of the wing depth can only be simulated with great difficulty and

to date have not been experienced in practice even in very thermic and turbulent conditions.



### TIP

Do not be tempted by the increased safety offered by RAST into taking greater risks. Instead, you should use RAST as your personal crumple zone if there is ever a situation where you have misjudged conditions.

## Line system

The ARCUS 2 RS has A, B and C- line levels, which fork once- (A-B level) or twice (C-level) from the bottom (riser) to the top (canopy) and which are divided into main, middle and top lines. The individual line levels are connected with one another using the “handshake knot”.

The Maintenance and Service book has a detailed line connection plan, showing the individual levels, connections and line descriptions.

With the brake lines, the individual levels are bundled at the end with the main brake line. This runs through the brake pulley on the riser and is knotted at the brake swivel of the control handle. There is a mark on the main brake line which allows the control handle to be correctly positioned.

The main lines are all attached to Maillon quick links. The lines are fed through special elastic rings and attached to prevent them from slipping and to ensure that they sit in the correct position.

## Risers

The 12mm wide risers, specially developed for the ARCUS 2 RS with Kevlar reinforcement allow the pilot to adjust the speed of the ARCUS 2 RS using a pulley system to suit his/her individual preference.

There is more information on using the speed system in the section “Flying the ARCUS 2 RS”.



### WARNING

The paraglider is delivered ex factory with the Maillon quick links secured using a strong thread-locking compound Loctite® to prevent unintentional opening. After service work, quick links which have been opened must be secured again against unintentional opening.



Fig. 3 ARCUS 2 RS riser

## Technical Data

ARCUS 2 RS	XS*	S	M	L	XL
Class	B	B	B	B	B
Canopy weight [kg]		4,8	5,1	5,4	5,8
Recommended take off weight (min - max) [kg]		80-95	92-105	102-115	115-135
Certified take off weight (min - max) [kg]	55-80	75-95	85-105	95-115	110-135
Wing area projected [m <sup>2</sup> ]	18,9	21,5	23,1	25,0	28,4
Wing span [m]	10,9	11,6	12,0	12,5	13,3
Number of cells	57	57	57	57	57
Number of riser	4	4	4	4	4
Maximum symmetrical control travel at maximum take off weight [cm]	> 55	> 60	> 65	> 65	> 65
Maximum speed system travel [mm]		140	155	155	155

The Service book has extensive technical information, (\*) in progress

## 04 Setting up the ARCUS 2 RS and first- flying

### Before the first flight



#### WARNING

A specialist must test-fly and inspect the glider before your first flight. The test-flight must be recorded on the glider information label.

During production, the ARCUS 2 RS goes through several quality control checks before finally undergoing an exact type certification test. Conformity with the reference specimen is checked and certified before the glider is delivered to the customer. Extreme care is taken in the manufacture of all patterns, lines and riser lengths. They show a high level of precision and should not be altered under any circumstances.



#### WARNING

Any changes or improper repairs to this paraglider render invalid the certification and warranty.

### Adjusting the main brake lines

The ARCUS 2 RS is delivered ex factory with a brake adjustment complying with that of the test sample. This position is marked on the steering line. This adjustment will allow you to steer and land the paraglider with almost no time lag.

The main brake lines must be checked by an expert before the test flight, and must be fastened so that the mark is visible approx. 5mm above the knot.

The length of the break line must not be altered.

### Factory settings

Correctly installed brake lines have about 10cm of feed. This is how far you must pull down the brakes before the trailing edge of the paraglider starts to move downwards and begins to brake. Note that the brake cascades already cause drag by their aerodynamic resistance.

The factory setting for the ARCUS 2 RS is intended to allow optimum handling. It is therefore generally not necessary to make any adjustment to the length. However, if required, the brake setting can be altered according to your particular preferences.

It can on occasions be worthwhile to make the brakes longer compared to the factory setting, particularly for teaching, launching on the flat or winch launching.

If you do adjust the brakes, under no circumstances should you go above or below the tolerance levels for the ARCUS 2 RS given in the Maintenance and Service book.

### Incorrect adjustment

If the brake lines are too long, the paraglider reacts slowly and is difficult to land. The brake lines can be adjusted during flight by wrapping them around your hands which will improve the flight characteristics. Adjust the brake lines to the correct length after you have landed. Changes to the braking distance should always be made in small increments of no more than 2 to 3cm and must be tested on a training slope. The left and right brakes must be adjusted symmetrically.

If the brakes are shortened, care must be taken that the paraglider is not slowed down in trim and accelerated flight because of the brake lines being too short.



**WARNING**

If the brake lines are too short, the following risks could arise:

- there could be an early stall
- the paraglider does not launch well and there is a risk of deep stall
- the paraglider exhibits dangerous behaviour in extreme flying
- the trailing edge of the paraglider is braked in accelerated flight which, in an extreme case, could cause a frontal collapse

Environmental conditions can also lead to the brake lines shortening.

You should therefore check brake line length regularly, particularly if there is any change in launch or flight behaviour.

Safety issues may arise and performance and launch behaviour may deteriorate if the brake lines are shortened too much.



**TIP**

Brake line length for the ARCUS 2 RS can be easily checked by making a simple comparison with an A-line. There is further information on this in the section “Quick brake line check”.

Brake knots

The overhand knot and bowline knot shown below are the most suitable for connecting the brake line to the brake handle.

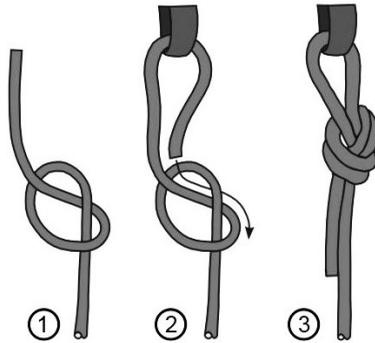


Fig. 4 Overhand knot

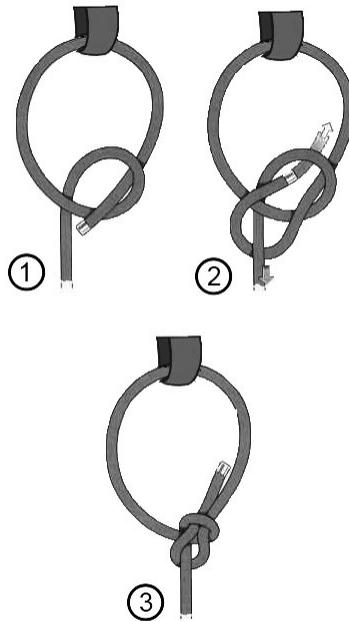


Fig. 5 Bowline knot



**WARNING**

Loose, unsuitable or incorrectly tied brake line knots can cause the main brake line to loosen and then lead to loss of control of the glider.

Ensure that only overhand or bowline knots are used and that they are tied correctly.

## Adjusting brake handle stiffness

The ARCUS 2 RS is fitted with SWING's Multigrip brake handles, which allows the stiffness of the grip area to be adjusted. The various options for stiffening the brake handles allow them to be adjusted to suit the pilot's particular preferences. There are 4 levels of stiffness possible using various combinations of the stiffening options. The pilot is able to choose the appropriate degree of stiffness by simply taking out or inserting the various parts.



Multigrip brake handle on delivery with both stiffeners



To remove the stiffeners, turn the Multigrip brake handle inside out and push the two small rods out through the opening



Multigrip brake handle after removing both stiffening rods. These are the various parts:

- ① Firm stiffening (bar)
- ② Soft stiffening (tube)
- ③ Multigrip brake handle without stiffening
- ④ Brake swivel
- ⑤ Main brake line

Fig. 6 Removing the stiffening from the Swing Multigrip brake handle and replacing it

The procedure is the same to insert the stiffeners: turn the Multigrip brake handle inside out and push the stiffening bar/tube into the handle again through the opening.

There is also a swivel ④ where the brake lines/brake handles connect to prevent the brake lines from twisting.

## Speed system

The ARCUS 2 RS already has a high basic trim speed, but this can be increased considerably by using the additional speed system. It is particularly useful if there is a strong headwind, for valley crossings or to leave a dangerous area quickly.



### WARNING

Do not make the speed system too short. The glider must under no circumstances be pre-accelerated as a result of the adjustment being too short.

Problems (such as collapses or tucks) have a more drastic effect with increased speed than in unaccelerated flight. It is generally strongly recommended that you do not use the speed system in turbulent areas and when flying close to the ground, because of the increased risk of collapse.

The A - and B-risers can be shortened using the speed bar. This decreases the canopy's original angle of attack and the speed of the glider increases.

The speed system must be correctly fitted and adjusted to ensure it operates smoothly during flight. Before first launch, the length should be adjusted to suit the pilot and the speed system ducting should be checked.

The speed bar and the riser are connected by special Brummel hooks. Adjust the length to the speed system so that your legs are fully stretched

when at maximum accelerated flight (the two riser pulleys next to each other), otherwise you may experience symptoms of fatigue in long flights.

You should still be in a comfortable flight position even when the speed system is used to its full extent.

You will not be able to use the paraglider's full potential if the speed system is too long.

Fasten the speed bar to the harness before launch to avoid tripping over it when preparing to launch or taking off.

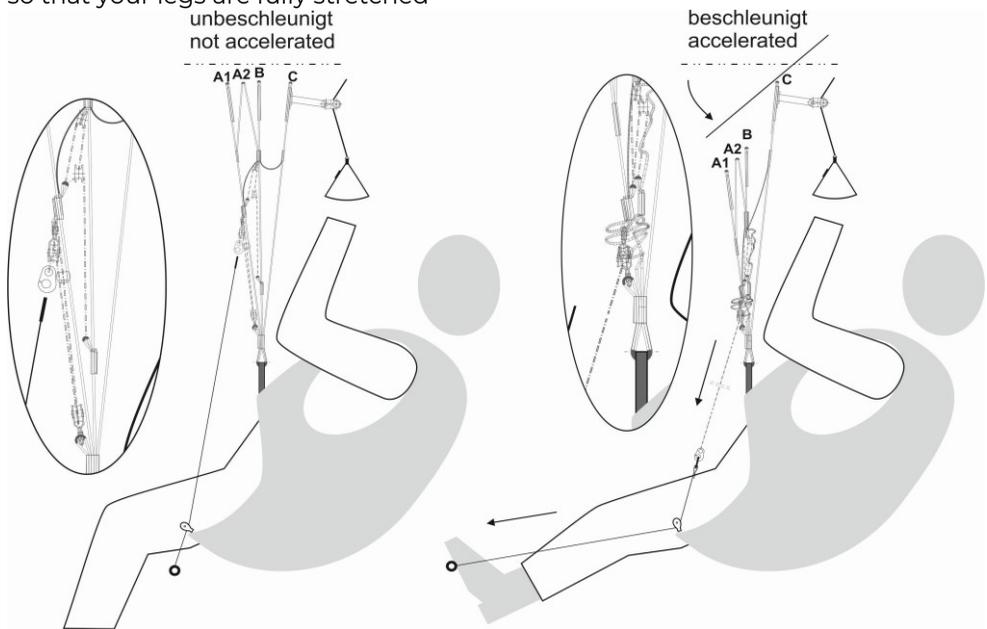


Fig. 7 How the ARCUS 2 RS speed system works

### Other features

The ARCUS 2 RS does not have a trimmer or any other adjustable, detachable or variable features in addition to the speed bar.

### Recommended weight range

The weight ranges given in this Manual generally refer to take-off weight (pilot weight including clothing, glider, harness and equipment). Determine your take-off weight by weighing

yourself with all of your equipment and your backpack.

The ARCUS 2 RS must be flown within the permitted weight range.

In addition to the permitted weight range, Swing gives a recommended weight range for the ARCUS 2 RS. The flight characteristics of the ARCUS 2 RS are particularly well-balanced in this range. The comments given below regarding dynamics in relation to wing-loading are particularly true if you are outside this range.

Swing offers the ARCUS 2 RS in various sizes. If you are choosing between two sizes, your personal flying preferences will determine which glider to choose.

If you prefer very dynamic flight behaviour with fast reactions and without hesitation, you should choose a high wing-loading, i.e. the smaller model.

The dynamics reduce in the medium and lower weight range. Flight behaviour becomes more straightforward and many pilots select this weight range because they climb a bit better in weak thermals. If these features appeal to you, you should fly with less wing-loading and choose the larger model.

You can therefore choose the size completely according to your own flying style.

## Ballast

If ballast is used to alter take-off weight, make sure that it is correctly positioned.

The ballast should preferably be stored in harness pockets specifically for this purpose. If your harness does not have special ballast pockets, then attach the ballast symmetrically as close as

possible to the centre of gravity or under the seat board.

Do not attach any additional ballast to the main hang point of the harness.



## WARNING

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

In particular, extreme flying and behaviour in spirals can become much more demanding if ballast is not positioned correctly.

## Reserve

It is a mandatory requirement to carry an approved reserve for use in emergency situations where the paraglider fails and recovery is not possible, for example after colliding with another aerial sports craft.

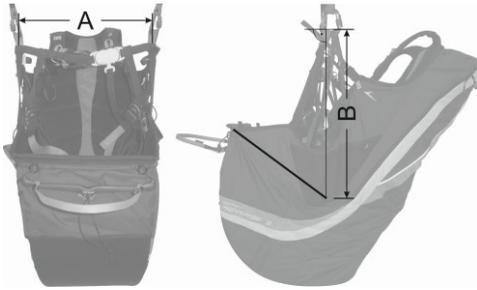
In choosing a reserve, you should be careful that you remain within the specified take-off weight. The reserve is fitted according to the manufacturer's instructions.

## Suitable Harnesses

GH group harnesses are suitable for use with the ARCUS 2 RS.

Please contact SWING or your SWING dealer if you have any questions about using your harness with the ARCUS 2 RS.

Harnesses with the following measurements were used for the type-test certification:



## Harness influence

Tests have shown that the harness, harness adjustment and the pilot's position in the harness have a noticeable effect on a glider's flight behaviour, so too using reserves in front containers.

This means that the flight behaviour in the particular paraglider-harness combination selected by the pilot can differ significantly from that documented in the certification test report.

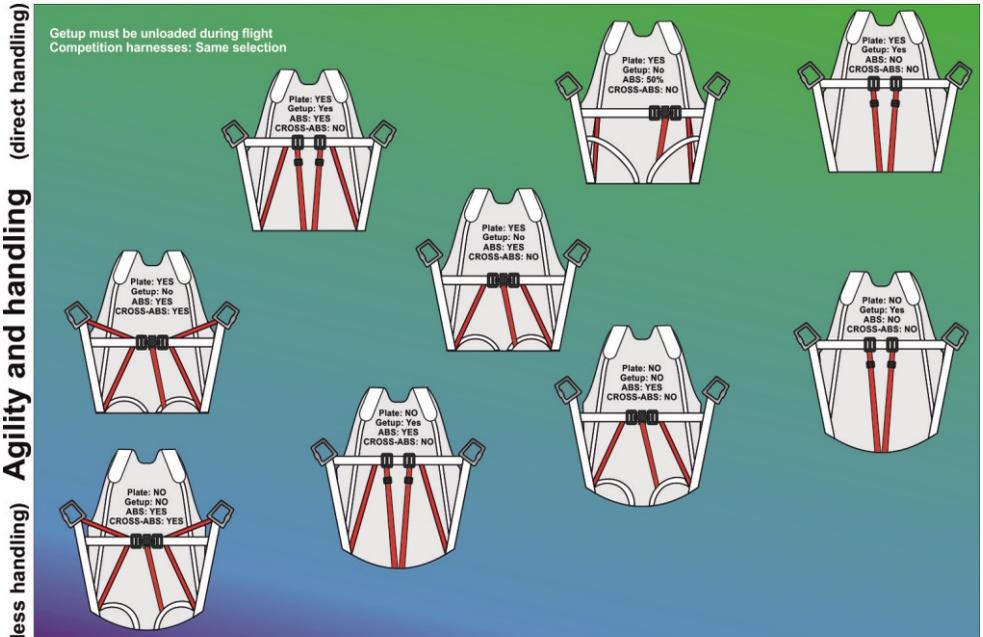
The illustration below shows the influence different harness geometries have on flight behaviour.

Bear in mind your own personal preferences when choosing a harness.

Total weight in flight	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 carabiner centre lines).

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



(very stable)

Stability and damping

(intensive communication)

Fig. 8 Overview of different harness geometries and damping

## 05 Flying the ARCUS 2<sup>RS</sup>

### First flight

Carry out your first flights only during stable weather, and in a familiar area or on a training slope. You should steer gently and carefully to begin with so that you can become accustomed to the reactions of the glider without stress.



#### WARNING

Do not overestimate your own abilities. Do not allow the paraglider's classification or the behaviour of other pilots to make you careless.

### Laying out the paraglider and pre-flight check



#### WARNING

A careful pre-flight check is required for any type of aircraft. Make sure that you exercise the same level of care each time carry out the check.

Before launching, always check the following:

- Are there any tears in the glider or other damage?
- Are there any knots or tangles in the lines?
- Are the brake lines clear and attached firmly to the handle?
- Are the brake lines adjusted to the correct length?
- Are the quick links to the lines and risers closed and secured?
- Is the canopy dry?
- Are the risers and seams in good condition?
- Is the harness in good condition?
- Is the handle for the reserve chute secure?

Place the paraglider with its upper surface against the ground and spread it out so that the leading edge is slightly curved.

Carefully sort out all the rigging lines and make sure that there are no lines underneath the canopy, tangled or caught up in any way.



#### WARNING

If there are obvious folds in the glider because it has been tightly packed or stored away for a long time, then the pilot should carry out some practice inflations before first launch and smooth out the leading edge a little. This ensures that the flow profile is correct during launch. It is particularly important in low temperatures that the leading edge is smoothed out.

### 5-point check

The 5-point check is carried out immediately before launch to check once again the most important safety points. It should always be carried out in the same sequence so that nothing is overlooked.

The 5 points are:

1. Is personal equipment correct (harness, carabiners, reserve, helmet) and are all straps done up?
2. Is the canopy arranged in a half-moon shape and are all the air-entrances open?
3. Are all the lines untangled and are any lines under the canopy?
4. Does the weather, in particular wind direction and strength, allow a safe flight?
5. Are the airspace and launch area clear?

## Launch

We recommend a forwards launch if there is little wind. Pull up the glider with the lines stretched. It is not necessary to use any momentum to launch the ARCUS 2 RS and/or to start running with slack lines.

While the glider is rising, guide both inner A-risers (without the “big ears” risers) upwards in an even arc motion, without shortening them. Avoid pulling hard on the risers. The ARCUS 2 RS launches very easily and is easy to control. Launching is even easier if the canopy is arranged in a half-moon shape.



### PLEASE NOTE

When reverse launching or ground-handling, be careful not to loop the brake lines through the risers because this can damage the risers.

The ARCUS 2 RS is suitable for reverse-launching from wind speeds of 3 m/s. The pilot turns around to face the glider with the updraft coming from behind. Pulling on the front lines makes the canopy start to rise above the pilot, as in a forwards launch. The pilot should turn around into the direction of flight when the canopy reaches its highest point, and can then begin to run and take off.

This method of launch makes it easier for the pilot to control the rising of the canopy and to carry out fine-tuning, so is therefore recommended in strong winds.



### WARNING

The pilot must work actively to keep the glider on the ground in higher wind speeds (from approx. 6 m/s), otherwise the glider may rise above the pilot unintentionally.

## Level flight

When the brakes are open, the ARCUS 2 RS's flight is stable and level. The brake lines can be used to adjust the speed according to the flight situation, to ensure the optimum level of performance and safety.

The best glide speed in calm air on the ARCUS 2 RS is achieved with the brakes fully open.

In calm air the ARCUS 2 RS reaches min. sink with slight braking.

If the brakes are pulled more, the sink does not reduce any further, the control pressures increase noticeably and the pilot reaches minimum speed. If you fly with the brakes in the half-wrap, minimum speed is reached just under the main carabiners.



### WARNING

Flying too slowly close to stall speed increases the risk of an unintentional asymmetric or full stall. This speed range should therefore be avoided and used only on landing.

## Turns

With the ARCUS 2 RS, SWING has developed a glider which reacts immediately to steering input and is extremely responsive. The ARCUS 2 RS performs best in turns when it is flown with sufficient speed and weight-shifting. Too much braking increases the sink rate.

The ARCUS 2 RS has very low negative tendency. If the pilot shifts his weight clearly to the braked side, the control travels are long and the glider turns tightly and accurately. So it can also be turned in a tight area by carefully pulling the inside brake line.

If the brakes are applied more, the bank attitude increases and the glider

will fly a fast turn increasing in steepness, which will eventually become a spiral dive (further information on this is in the section “Spiral Dive”).



**TIP**

The general principle when turning is first to use weight-shifting and then to apply the brakes. The advantages of this are:

- longer control travel
- more direct handling
- less sink in turns

**Emergency steering**

If for some reason the brake lines are not working, e.g. if the knot on the brake handle has come undone or a brake line is defective, the ARCUS 2 RS can also be steered and landed using the back risers.

In this case, stall happens more quickly and the pilot must compensate for the changed flight behaviour by pulling carefully on the risers.

**Rapid descent methods**



**WARNING**

Any rapid descent methods other than those described in this section have not been tested by SWING. SWING advises against using any rapid descent methods other than those described in this section. In an extreme situation, they could result in uncontrollable flight positions.

Many flying situations call for a very rapid descent to avoid a dangerous situation, e.g. the upcurrent from a cumulus cloud, an approaching cold front or a storm front.

Rapid descent methods should all be practised in calm conditions and at sufficient altitude so that a pilot is then able to employ them effectively if extreme conditions arise. The rapid descents are divided into three different manoeuvres which increase the sink rate in a safe and controllable manner.

**Spiral dives**



**WARNING**

In the spiral dive, very high turn speeds can be reached with an increase in acceleration due to gravity (up to over 6g), so exercise care when attempting this manoeuvre. Take note of the following:

Do not enter the spiral dive by way of a wingover. High sink rates can be reached very quickly by doing this. It is not possible to safely gauge the sink rates.

Do not continue the spiral dive for too long; it could cause a loss of consciousness.

Always maintain **ground clearance of 150 – 200m**. The manoeuvre must be exited at this height above ground.

Spiral dives with “big ears” lead to extreme loading of the open section of the canopy. This move is prohibited in Germany.

The spiral dive is the most effective method for making a rapid descent, and can allow sink rates of up to 20m/s to be reached. It is suitable where there is a high ascent rate and little wind.

During testing, the ARCUS 2 RS always recovered automatically from spiral dives when the pilot’s position was

neutral. It may continue to turn over several rotations.

The length of time it continues to turn depends on sink rate and harness geometry and adjustment.

Exit the spiral dive actively and in a controlled manner. At higher sink rates, exiting the manoeuvre can take several turns.

Given the complexity and the possible risks of the spiral dive, SWING recommends that this manoeuvre be learnt under qualified instruction.

### Starting the manoeuvre

Begin the spiral dive whilst flying at full speed by flying a turn which becomes tighter and tighter and by using weight-shifting to the inside (refer here to "Turns" also).

The bank angle and sink rate are controlled by carefully applying or releasing the inside brake and by gently applying the outside.

Look down before and during the spiral dive to maintain a constant check on your distance from the ground.



### TIP

The outer wing tip may collapse during the spiral dive although this is no cause for concern. It can be avoided by lightly braking on the outside. Release the brakes carefully.

### Recovery

Recover from the spiral dive slowly and steadily over several turns. The inside brakes are gradually released. If the brakes are released too quickly, the increased speed can cause the wing to climb, become unsettled or partly collapse. Recovery can be assisted by braking lightly on the outside.



### DANGER

Under certain conditions it may be necessary to brake the outside half of the wing and/or to use weight-shifting to recover from the spiral.

Furthermore, for exiting the manoeuvre, several turns with a corresponding loss of altitude may be required.

You must **immediately** deploy your reserve if you lose control of the glider and the sink rate and find yourself in a stable spiral.

The spiral may lead to loads and/or disturbance to consciousness which prevent later deployment of your reserve.

### **B-stall**

In the B-stall, a stall is provoked and the paraglider sinks vertically with a sink rate of approx. 10 m/s. The ARCUS 2 RS remains stable and achieves high sink rates, making it well-suited for the B-Stall.

### Starting the manoeuvre

Grasp both of the B-risers on the mallions at the coloured mark. Pull both B-risers evenly down until the airflow is broken and the wing goes completely into vertical descent flight mode. The B-risers should then be held in this position to ensure a gentle descent.



### TIP

Pull down the B-risers only until there is no airflow. If they are pulled down any further, the glider could go into a horseshoe.

Check before and during the B-stall that the airspace beneath you is clear.

Recovery

Return the B-risers quickly and evenly into their normal position. The glider may go into a deep stall if they are released too slowly or into a negative spin if not released symmetrically. If this happens, the speed must be increased using the speed system or by pulling the A-risers forward.



**WARNING**

The canopy speeds up after the B-risers have been released until the airflow returns. Under no circumstances should the brakes be applied at this time.

This manoeuvre should be avoided at low temperatures. Pilots should be aware that this considerably increases the tendency to deep stall.

**Big Ears**



**WARNING**

The technique of big ears causes a higher load for the line groups which are still weight-bearing. Therefore, do not fly any extreme manoeuvres with big ears.

This manoeuvre should be avoided in low temperatures. Pilots should be aware that this increases the tendency to deep stall.

Big ears are the simplest method for rapid descent and have a sink rate of 3-5m/s. The advantage of big ears is that the glider continues to fly straight, meaning that a danger area can be avoided. It is even possible to land using big ears, for example on a top-landing to compensate for the updraft. The wing-loading increases by the reduction in the wing's surface area, the wing becomes more stable against collapses in turbulence. Nevertheless,

the air resistance of the wing also increases, and it flies more slowly and closer to the stall limit. To counter this and to increase the effectiveness of the sink, the speed bar is generally also used in combination with big ears.

Starting the manoeuvre

Start the "Big Ears" manoeuvre by pulling both outer A-lines downwards. This should start the manoeuvre by folding down a sufficiently large part of the wing tips so that the pilot does not then have to counteract the tendency to reopen. It is important with the ARCUS 2 RS not to pull down the outer A-risers too far for "big ears", as the "ears" start to flap.

If too much surface area has collapsed ("ears" flapping, high holding forces): re-open the ears and pull down and hold with slight force.

To make the manoeuvre more stable and more effective, slightly accelerate the wing after pulling in the ears.

The brake lines are held steady and the pilot uses weight-shifting to steer the paraglider. You can now descend safely on the stable middle part of the wing. The brakes must not be shortened during the manoeuvre, e.g. by wrapping the brake lines.



**TIP**

For the big ears manoeuvre, take hold of the A2 risers quick link and pull down firmly.

Then apply the speed bar, as the big ears manoeuvre increases the angle of attack.

Recovery

For recovery release the speed bar, wait until the wing has slowed down and let go of both A-risers. Assist the opening process by a short, impulsive pumping

motion with the brakes if the ears do not open automatically.

## Landing

There are no specific characteristics to observe during landing. Prepare for landing by making a straight approach flight into the wind and allow the glider to decelerate at trim speed. At 1m above the ground, the brake lines are pulled down as far as they will go, so that the paraglider has been fully braked just before the ground is reached.

The brakes should be applied in a more regulated manner if there is a strong headwind. Landing out of a steep turn or a rapid change of direction before landing should be avoided because of the pendulum effect caused.



### WARNING

Always fly with sufficient speed when you are near the ground (well above stall speed) to avoid an unintentional stall.

## 06 Types of use

The ARCUS 2 RS was developed and tested for use solely as a paraglider for foot launch and for winch launch. Any use other than as intended is prohibited.

### Winch launch

The procedure for a winch launch is similar in its initial stages to a forwards launch. After the canopy has been pulled up to its highest point, the pilot rises from the ground by the tension of the tow line. Under no circumstances should the “start” command be given before the glider is completely under control. Major changes to direction should be avoided during the launch phase and before reaching a safe altitude. After having left the ground, the pilot will be slowly towed in a flat angle up to the safe altitude of 50m. During this phase, the pilot must remain ready to run and must not sit back in the harness, so that it is possible to land safely in the event that the winch or tow rope fails. Ensure that the glider is flown with open brakes so that the angle of attack is not increased further by the brakes.



#### TIP

For a winch launch too, laying out the canopy in a half-moon shape will help to ensure that it fills and rises evenly on launch.

This considerably reduces the need to make corrections during launch, allowing a controlled and safe launch.

On a winch launch, the glider should if possible be steered only by weight-shifting. Brisk, forceful steering input with the brakes can be used to help

correct direction, without braking the glider too much and stalling it.

Winch-towing requires special training and special regulations must be observed. These are:

- The pilot must have completed the appropriate training and hold a licence.
- The winch and release must have a certificate of compliance which covers the towing of paragliders.
- The winch operator must have undertaken training which includes the towing of paragliders.
- The ARCUS 2 RS may not be towed with a towline tension of more than 100 daN.



#### WARNING

The paraglider must not under any circumstances be towed by motor vehicle or motor boat etc. if you do not have the appropriate towing equipment and a suitable winch operator.

### Attaching the towline release system

The optimal attachment point for the towline release should be as close as possible to the system’s centre of gravity. On a paraglider the ideal attachment point is level with the harness attachment point or directly on the risers.

It is not essential to use a suitable tow adaptor, but it is recommended and provides the pilot with greater safety during the towing phase.



#### PLEASE NOTE

SWING recommends that pilots use an appropriate tow adaptor, which gives greater safety margins during towing.

SWING offers the option of the adjustable tow adaptor “Pro-Tow”, which facilitates the tow procedure during launch and pre-accelerates the canopy during this stage by about 2cm.



### WARNING

When using rigid tow releases, the release/shackle distance should be extended sufficiently (cord or webbing strap) and the release must be secured with a retaining cord so that it does not fly back (in the event of towline failure).

When using the release system attachment, ensure that the distance between the risers is not reduced (risk of twist).

If a front-mounted reserve system is being used when towing, it is important to ensure before first launch that it can be deployed without any obstruction. If this is not the case, then a suitable webbing release system should be used.

The ARCUS 2 RS was not developed or tested for aerobatic use.



### WARNING

Any type of acrobatic manoeuvre at all on the ARCUS 2 RS is contrary to law and illegal. The pilot would be putting his/her life at risk. Acrobatics involves a risk of unpredictable flight attitudes, which could lead to damage to material and structural failure.

## Motorised flight

In Germany, use of paragliders for motorised flight requires additional certification.

## Tandem paragliding

The ARCUS 2 RS does not have certification for use in tandem paragliding.

## Aerobatics

In Germany, it is prohibited to perform aerobatics using a paraglider, which under German law is included under the term “aerial sports equipment” - *Luftsportgerät*. Aerobatics is defined as flight manoeuvres at an angle greater than 135° along the longitudinal (roll) axis or lateral (pitch) axis.

## 07 Dangerous situations and extreme flying

### Dangerous situations

Pilot error, extreme wind conditions or turbulence which the pilot does not notice quickly enough may put the wing in an unusual flying position, requiring special reaction and skills on the part of the pilot. The best way to learn how to react calmly and correctly in a serious situation is to attend safety training, where you will learn how to manage extreme situations under the guidance of a professional.

Ground-training is another safe and effective method of familiarising yourself with your glider's reactions. Launch can be practised, as can small flying manoeuvres, such as stall, asymmetric collapse, front stall etc.

Any pilot who flies in turbulent conditions or who makes an error in handling the glider is at risk of getting into an extreme situation. All of the extreme flight figures and flight attitudes described here are dangerous if they are carried out with inadequate knowledge, without the right safety altitude or without training.

Please note that all manoeuvres described in this manual where performed during type-test certification with a harness with the following dimensions:

Total weight in flight	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 a harness different from the one used for the type-test certification is used,

flight behaviour may vary from that described in this Manual.



### WARNING

Always keep within the recommended limits. Avoid aerobatics and extreme loading such as spirals and big ears. This will prevent accidents and avoid over-loading the glider.

In turbulent conditions, always keep enough distance from rock faces and other obstacles. Time and sufficient altitude are needed to recover from extreme situations.

Deploy your reserve if the corrective manoeuvres described in the following sections do not return the glider to a controllable flying position or if there is not enough altitude for correction.

### Safety training



### WARNING

These instructions are not a substitute for the need for safety training. We therefore recommend that you take part in special safety training which will teach you how to handle extreme situations.

Taking part in safety training is in principle advisable in order to familiarise yourself with your glider and the correct reactions in extreme situations. However, safety training also subjects your equipment to extreme loads.

### Material stress and damage

SWING advises against subjecting the materials of the ARCUS 2 RS to excessive stress during a safety training (SIV) course.

Uncontrolled flight positions can occur during safety training, which are outside the manufacturer's limits for the paraglider and which can put the glider under excessive stress.

Trimming the line lengths and canopy material after safety training can lead to a general deterioration in flight characteristics.

Damage as a result of safety training is not covered by the warranty.

## Safety training and RAST

Most manoeuvres can be practised with the ARCUS 2 RS during safety training in the same way as with a glider without RAST.

Only those manoeuvres for which the glider must be actively collapsed (asymmetric collapse, front collapse) require higher forces to enter as a rule than would be necessary with a glider without RAST.



### WARNING

Refrain from doing wingovers with the glider to make a more large-scale collapse possible.

A provoked collapse from a roll or pitch movement can lead to uncontrolled flight positions. Such collapses are unrealistic and have no training benefit.

## Collapsing the paraglider

### Asymmetric collapse

Asymmetric collapses are caused by the stagnation point moving to the trailing edge of the glider. A negative angle of attack makes part of the canopy collapse and tuck under, and the glider may plunge down, turn away or spin.

### Recovery

Should an asymmetric collapse occur, counter-brake slightly on the side of the glider that is still inflated to stop it turning away and to stabilise it, until the glider flies straight ahead again. With large asymmetric collapses, it is important to counter-steer carefully so that the glider does not stall completely and go into a full stall.

The part of the glider which has collapsed generally re-inflates automatically but this can be assisted by applying light brake pressure on the collapsed side (but not hectic "pumping") while counter-steering on the opposite side. Make use of the full braking distance.

Following a very large collapse of more than 70%, the wing-tip of the collapsed side may become trapped in the glider lines. Our tests have shown that the ARCUS 2 RS continues in level flight surprisingly well, even with major cravats, by counter-braking and weight-shifting on the open side. Most cravats can be reopened by pulling firmly on the stabilo lines.



### WARNING

Counter-steering too strongly on the inflated side of the glider can result in a stall and to further uncontrolled flight manoeuvres (cascade of events).

### Front stall

A negative angle of attack can also cause part or all of the leading edge of the glider to collapse.

### Recovery

The ARCUS 2 RS will normally recover quickly and automatically from a front stall, but re-inflation can be assisted by light symmetrical brake input. In the

case of extreme front stalls across the entire wing chord, the wing tips may move forward making the glider form a U-shape. Again, recovery is by light symmetrical braking on both sides, but care must be taken that both wing ends return to normal flight evenly.

## Types of stall

When a paraglider flies through the air, a laminar and turbulent boundary layer is created. Extremely dangerous flight configurations can result if the laminar boundary layer is interrupted, with practically the entire airflow along the top surface braking away. This happens in particular when the angle of attack is too great.

There are three different types of stall in paragliding.



### WARNING

Full stall and spin are manoeuvres which can be fatal if recovery is not correct. These manoeuvres should therefore be avoided. However, it is important to learn how to recognise the indications that a glider is about to stall so that you can take immediate action to prevent it.

## Deep stall

Paragliders can go into a deep stall for a variety of reasons: brake lines too short (no slack), old or damaged glider material which therefore has increased level of permeability, altered trim/line length and changes to profile characteristics caused by moisture (e.g. flying in rain). Paragliders have a particular tendency to stall if the wing-loading is too low.

In a deep stall, the airflow from the front reduces and the glider goes into a stable flight attitude without forward momentum. The paraglider sinks

almost vertically at 4-5m/s and there is noticeably less flight noise.

### Recovery

Remain in an upright position and push the A- and B-risers in the direction you are flying, so as to shorten them by 5-10cm.

If you have a speed system, you can also use it to accelerate, so that the glider goes into a normal flying position from the deep stall.

After you have landed, the glider and the length of the lines must be checked.

### **Full stall**

With a full stall, the lift-generating airflow over the glider breaks away completely or nearly completely.

It is triggered when the maximum possible angle of attack is exceeded. The most common cause is going below the minimum speed or flying near the minimum speed combined with the effects of turbulence.

In full stall, the paraglider loses its forwards travel, surges backwards and deflates. If the brakes are held down, the canopy comes up over the pilot again. The result is an almost vertical descent with a sink rate of approx. 8m/s.



### WARNING

If the canopy has gone back during the full stall, the brakes must be held down, otherwise the canopy may surge forward and, in an extreme case, end up underneath the pilot. Hold the brakes down until the canopy is above you again.

### Recovery

Fully release the brakes within 3 seconds (count 21, 22, 23). If the brakes

are released too slowly, the paraglider may spin. The spin stops automatically when the brakes are released completely.

## Spin

The spin is a stable flight attitude, in which one side of the canopy stalls, while the other side continues to fly forward. The glider turns around the stalled side of the wing.

### Recovery

To recover from the spin, the pilot must quickly release the brakes. The stalled side of the wing will then speed up again. Depending on recovery and the dynamic of the circular motion, one side of the canopy may shoot forwards and suffer an asymmetric collapse. If the pilot suspects that the glider has unintentionally been put into a spin, the brake which has been pulled down too far must be released immediately.



### WARNING

If the spin does not stop, check whether you have released the brakes fully!

## Other tips for dangerous situations

### Stalling in rain

In general, there are two reasons why a paraglider may go into deep stall in rain:

1. The first risk lies in the fact that the canopy weight increases if a glider is flown in rain for any length of time. The centre of gravity and angle of attack then shift, which can result in airflow separation/stall. It is relevant here that if a glider absorbs more water (as older gliders do because they lose their water-repellent coating over time) and

is closer to the deep stall limit because of its design and age, less water absorption and thus weight increase will put the glider into deep stall.



### WARNING

Flying in extremely humid weather or in rain is outside of the operating limits of the glider. If you are not able to avoid flying in rain, please observe the following:

- it is advisable to fly with slight acceleration during and after the rain (min. 30% or more)
- use no brake input or as little as possible
- do not use big ears
- control travel reduces
- avoid tight turns, especially in the final approach. If conditions allow, you should also fly slightly accelerated in this phase
- avoid large angles of attack and the possible early stall near the ground (release the speed bar only slowly)

2. When there is rain, there can be so many water droplets on the top surface of a glider that almost the entire upper surface is affected but, even so, the drops “bead” so the surface is not wet through. This makes the top surface so “rough” in texture from the drop formation that the airflow over the top of the wing separates from the surface. This phenomenon has been known for some time from hang-glider and gliding. With new gliders, the droplets are absorbed less quickly by the fabric. Thus, the newer a glider is, the greater the number of droplets caught on the top surface and the bigger those droplets are, the greater the risk that there could be airflow separation. We were able to recreate these conditions

by practical tests and computer simulations, but they occur very rarely.

It is the case in both of the above situations that the control travel and braking distance first reduce and then the deep stall is caused, mostly by alteration of the brake travel or angle of attack, e.g. by a gust or thermal.

As a general rule, operating temperatures below  $-10^{\circ}\text{C}$  should be avoided.

## Advertising and adhesives

Always make sure before attaching advertising to the glider that the adhesive planned will not alter the glider's flight behaviour. If you are in doubt, we recommend that you do not attach the adhesive.



### PLEASE NOTE

Attaching adhesives to the glider which are large, heavy, or made of unsuitable material may result in revocation of the certification.

## Overloading

The glider structure is put under high levels of strain in particular on extreme flight manoeuvres, rapid descent methods (spiral dives) or prohibited aerobatic manoeuvres. They considerably accelerate the aging process of the structure and should therefore be avoided.

The glider must be inspected earlier than is usually the case if it has been put under more than the usual degree of strain.

## Temperature range

Extreme temperatures can affect air density and thus the glider's flight behaviour. Be aware of this particularly in low temperatures and observe the corresponding instructions for the various manoeuvres.

## 08 Storing and looking after the paraglider

### Storing the paraglider

#### Storing and transporting the glider

Even if your paraglider was completely dry when it was packed up after the final flight of the season, for long-term storage you should if possible take it out of the back pack and spread out the canopy a little in a clean, dry place away from direct light. If you do not have the space to do this, then open the backpack, internal bag and belt as much as possible and avoid compressing it. It must be stored at a temperature between 10° and 25° C and in relative humidity between 50 and 75%. Make sure too that the paraglider is not stored in a place where animals such as mice or cats could use it as a place to sleep.

Do not store the paraglider near any chemicals. Petrol, for example, causes the material to disintegrate and can cause considerable damage to your paraglider. When your equipment is in the car boot, keep it as far away as possible from any spare petrol cans or oil containers.

The ARCUS 2 RS should not be exposed to extreme heat (e.g. in the boot of the car during summer). The heat may cause any moisture present to be pressed through the fabric, thereby damaging the coating. High temperatures accelerate the process of hydrolysis, particularly when combined with moisture, which damages fibres and coating. Do not store your paraglider near radiators or other heat sources.

Always transport your glider in the special inner bag and use the backpack provided for the rest of the equipment.

#### Packing the paraglider

It is very important to pack the paraglider carefully to ensure the longevity of the leading edge reinforcements. Fold up the glider as shown in the diagrams 1-4 below.

The leading edge reinforcements are placed on top of each other to avoid bending or misshaping them. This method of packing helps ensure careful treatment of the leading edge, which will increase the life of the reinforcements and maintain the performance and launch behaviour of your glider.

If the reinforcements have been bent or misshapen, they distort more easily during flight, creating an altered air inflow which can lead to a loss in performance and changes in flight behaviour.

The leading edge reinforcements also perform an important function on launch. Therefore, the less they have been bent, the more easily the glider will inflate and launch.



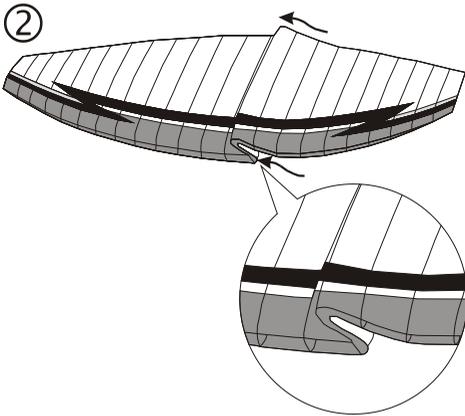
#### PLEASE NOTE

Make sure that the leading edge reinforcements lie flat and are not bent or twisted by doing up the Velcro too tightly.

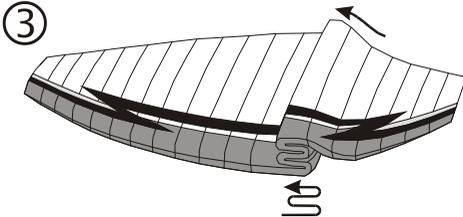
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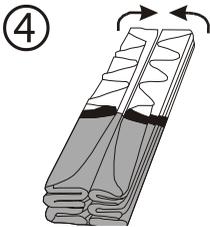
Spread out the paraglider completely on a smooth surface.



Next, all the ribs on one side are placed one on top of the next, so that the leading edges are not bent.



Then continue with the second step side, placing the leading edges one on top of the next until you reach the tip of the glider.



The glider is now folded up along its length, and the leading edges are on top of each other without having being bent.

Fig. 9 Sequence folding the ARCUS 2 RS

## Looking after the paraglider

### Handle with care

The life of any paraglider depends to a large extent on how you treat it.

The ARCUS 2 RS is constructed in a weight-optimised manner, with heavier, robust fabrics for the leading edge and lightweight fabrics for the top and bottom surfaces.

The materials used are dimensioned in such a way that, if carefully handled, they will retain their features for many years and many hours of airtime.

Please follow the care instructions and handle the ARCUS 2 RS carefully so that it stays in good condition for a long time.



### PLEASE NOTE

Do not drag the paraglider across any rough surfaces such as gravel or asphalt. This may damage its seams and surface coating!

### Fabric

SWING uses a specially developed polyamide fabric for the ARCUS 2 RS which has a high-quality coating for improved UV resistance, colour fastness and air permeability. This fabric undergoes rigorous laboratory tests and was tested for several months under extreme conditions and heavy use in flight.

Care is essential to ensure that the fabric and glider remain durable and retain their qualities. The glider should therefore be protected from unnecessary UV light. Do not unpack your glider until immediately before flight and pack it up straight after landing. Modern paraglider fabrics have better protection against the sun, but UV rays in particular are still one of the decisive factors in how the fabric ages. The colours will fade first and then the coating and fibres will begin to age.

When the ARCUS 2 RS is manufactured, the side of the fabric

with the coating is kept to the inside. This provides relatively good protection from damage for the coating which is of key importance to the fabric's features. When choosing a place to launch, try to find somewhere which is smooth and free of stones and sharp objects.

Do not stand on the glider. This weakens the fabric, especially if it is on a hard or stony surface. Pay attention to the behaviour of spectators at the launch site, especially children: do not hesitate to draw their attention to the sensitive nature of the fabric.

When you are packing up your glider, make sure that there are no insects trapped inside. Many insects produce acids when they decompose, which can cause holes in the fabric.

Grasshoppers make holes by biting through the fabric and also excrete a dark liquid which stains. Keep animals away when you are packing up.

A brand-new glider will often be compressed when delivered. This is solely for the initial delivery and the glider should not be compressed in such a way again. Do not pack your glider too tightly after use and, even though it is very comfortable, never sit on the backpack with the glider inside.

### Lines

The ARCUS 2 RS has various different high-quality and accurately manufactured lines which have been selected according to the load and area of use. You should also protect the lines from unnecessary UV light because, as with the fabric, UV light in particular will weaken the lines.

Be careful that there is no abrasion caused to the coating on the lines by rubbing, particularly when ground-training with crossed risers.

Do not walk on the lines after the glider has been spread out and watch out for spectators or skiers who may inadvertently go over the lines.

When you are packing up the glider, be careful to avoid putting any unnecessary kinks in the lines and use only the overhand knot or bowline knots described for the brake lines.



### PLEASE NOTE

Dyneema lines, which are used in the area of the main brake lines, for example, are very temperature-sensitive and can be permanently damaged at temperatures above 75° C. Therefore your glider should never be stored in a hot car especially during summer

### **Dampness / humidity**

If the glider gets wet or damp, it should be dried as soon as possible in a well-ventilated room (but out of the sun). It may take several days before the canopy has dried completely because the fibres absorb water. Mould may form if the paraglider is stored wet and the fibres may rot, particularly when it is warm. This can make the paraglider unsuitable for flying within a short time.

Likewise, if a wet glider freezes, it can also become unsuitable for flying after a short time.

### **Contact with salt water**

If salt water gets on the glider, before being dried, it should immediately be thoroughly rinsed in fresh water. It should then be dried in a well-ventilated room (but out of the sun).

If the glider is not thoroughly rinsed, there may be permanent damage to the material.

## Sand and salt air

In many cases, sand and salt air cause the lines and fabric to age much more rapidly. If you often fly near the sea, the glider should be inspected more frequently than normally required.

## Cleaning

If you do have to clean the glider, use only lukewarm fresh water and a soft sponge. Use a weak soap solution for stubborn stains, and then rinse it out carefully and thoroughly. Leave the glider to dry in a place which is well-ventilated and in the shade.



### PLEASE NOTE

Do not use chemicals, brushes, rough cloths, high-pressure cleaners or steamers to clean the glider, as these can damage the fabric coating and weaken it. The glider becomes porous and loses braking strength.

## 09 Repairs, Inspections and Warranty

### Type designation

SWING paragliders have an exact identification on the underside of the stabilo lines or on the centre rib, which is obligatory for all paragliders. The information required is set out in the airworthiness requirements.

It is helpful to provide the type designation of the paraglider if you are contacting your SWING dealer with any queries or ordering replacement parts or accessories, to ensure accurate identification.

### Spareparts

In general, only original spare parts may be used for maintenance and repair.

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

Repair material particularly for sewing work on the canopy is available from SWING only for authorized SWING workshops.

### Repairs

#### Small repairs to the glider

You can repair small tears in the wing yourself using self-adhesive sail material, provided that the tears are in places which do not bear heavy loads, are not at the seams and are no bigger than 3cm.

Single replacement lines for the ARCUS 2 RS can be ordered direct from us at:

[info@swing.de](mailto:info@swing.de)

The replacement of complete groups of lines must be carried out by a SWING authorised workshop.

### SWING workshops

All repairs and servicing should be carried out by a SWING authorised workshop or directly by SWING. SWING workshops have trained staff, original SWING parts and the necessary know-how, all of which will ensure top quality.

### Regular inspections

The following parts and materials must be inspected regularly for damage, abrasion and correct operation, e.g. after landing:

- Risers and quick-links
- Lines
- Fabric

### Lines



#### PLEASE NOTE

Environmental conditions such as high temperatures or moisture can affect line length.

Check the line length regularly, particularly if you notice any change in launch or flight behaviour.

The line length should be checked if you have landed in water or if the lines have got wet through.

The lines have a significant influence on flight behaviour. Correct line length and symmetry are also important for performance and handling. Measuring line length is part of regular paraglider inspection. For this purpose, the lines must be loaded with a 5kg weight so as to ensure reproducible results that can be compared with the lengths in the check sheets. Line lengths for the ARCUS 2 RS are given in the Service Book.



**WARNING**

Do not under any circumstances use knots to shorten the lines. Any knot will weaken the line considerably and may cause the line to break in case of high load.

The overhand knot and bowline knots described are permitted only for connecting the main brake lines/brake handle.

SWING recommends regular inspection of the lines after one year or every 50 hours airtime. It is sufficient to inspect just the main lines when checking trim. The main lines are susceptible to the biggest changes, as they are very long compared to the upper cascade lines and are under high load. With the ARCUS 2 RS, all main lines in one group must be the same length (AI, BI, CI is the first group, AII, BII, CII the second, and AIII, BIII, CIII the third). The maximum difference between individual line lengths is 10mm. If the difference is greater, please send your glider to SWING or a SWING authorised workshop to be checked and adjusted.



**WARNING**

A damaged line can result in loss of control of the glider. Always replace lines which are damaged.

If you need to replace damaged or worn-out parts, use only original parts or approved parts from the manufacturer.

Lines age and lose strength even if the paraglider is used infrequently or not at all. This can affect the safety and function of your paraglider. Signs of wear are slight bumps or changes in flying characteristics. The lines must then be replaced immediately. Use

only inspected and approved lines, which can be obtained through SWING.

**Quick brake line check**

The ARCUS 2 RS is fitted with a system that allows pilots to check easily the basic set-up of the brakes.

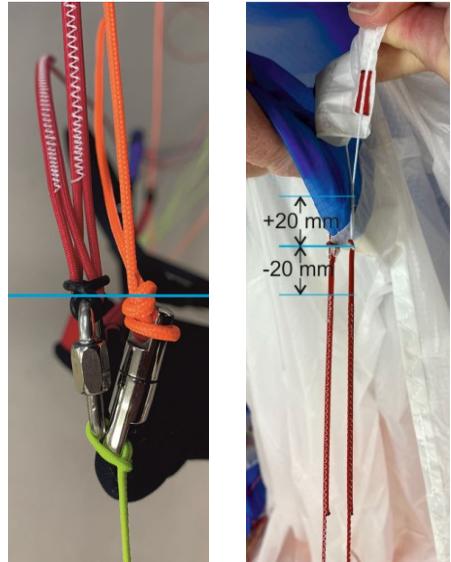


Fig. 10 Measuring points for the quick brake line check

To do this, the overall length of a relatively highly loaded inner A line is compared with a less loaded brake line with an attached weight of 5kg. The loops for the lines to be compared are in colour, the two lines must be the same length. This position shows the minimum brake line length (factory setting) as per the Service Book. The maximum difference between the individual line lengths is 20mm. If you make any changes to brake line length, always use minimum brake length for reference.

If you are not sure about the correct length of the brake lines, please send

your glider to SWING or a SWING authorised workshop to be checked.

## Inspection

### General

SWING's service programme as set out in the Maintenance and Service book should be followed so that the same high level of flight safety, operational safety and reliability is ensured for your glider in the future as well.



### PLEASE NOTE

Read the Maintenance and Service book and follow the terms therein to ensure the validity of SWING's warranty, the glider's certification and insurance cover.

Failure to observe the inspection periods shall render invalid the certification and warranty. A properly completed logbook with details of all flying and training will help you to comply with these periods.

There is additional information on inspections in two separate booklets, both of which form part of this Manual:

1. Inspection information and
2. Maintenance and Service book.

These can be downloaded from our website at:

[http://www.swing.de/ARCUS\\_2\\_rs-en.html](http://www.swing.de/ARCUS_2_rs-en.html)



### PLEASE NOTE

The owner is responsible for the airworthiness of the paraglider. This includes complying with the inspection periods.

### Inspection periods

SWING gliders must be inspected as follows (check the situation in your country):

- All Gliders must be inspected every two years from the purchase date.
- The glider must be inspected after 150 hours of use (including ground handling) if this occurs first.

Ground handling time must be at least doubled when calculating the total hours of use because of the increased wear and tear on the glider.

### Validity of inspection

It is very important that your glider is serviced at the required intervals throughout its entire life.

Please be aware here of the specific requirements set out in the maintenance instructions.

In order to benefit from SWING's warranty:

- you must have your paraglider inspected by SWING or an inspection agent authorised by SWING
- the documentation and the result of the inspection must be clearly identifiable (date and place / name of the inspector) and be entered near the glider information/certification sticker.

The liability and warranty of SWING Flugsportgeräte GmbH will lapse if the inspection is carried out by the pilot or a not authorised person.

The DHV recommends that inspection is carried out by the manufacturer/importer or by an authorised inspection agent.

### Warranty

SWING's warranty is a comprehensive service package, which fulfils high standards for customer service and customer care. The terms of the warranty are written on the website.

Go to the SWING website:

www.SWING.de → Service →  
Guarantee

<http://www.swing.de/guarantee.html>

The manufacturer must be notified immediately of any defects in the product, variations or changes in flight behaviour and any warranty claims. If necessary, the glider or other SWING product must be sent to SWING Flugsportgeräte GmbH for inspection.

# 10 SWING on the World Wide Web

## SWING website



SWING has a comprehensive website, which provides additional information about the ARCUS 2 RS and many other issues related to paragliding. SWING's website is the first port of call for SWING's worldwide following:

[www.SWING.de](http://www.SWING.de)

On SWING's website, you will find an extensive range of accessories for your paraglider, useful products for pilots, as well as additional information and accessories for your ARCUS 2 RS.

You will also find links there to other services and websites:

- Service
- Accessories
- Facebook, Twitter & youtube

These websites and their content are provided for your use. The content of SWING's websites has been made available for your use on an "as is" and "as available" basis. SWING reserves the right to alter the websites at any time or to block access to them.

## Facebook, Twitter & youtube



SWING is very active with the new media of Facebook, Twitter and youtube and has various websites which are updated daily on various topics related to aviation and SWING products.



[www.facebook.com/pages/SWING.Paragliders](http://www.facebook.com/pages/SWING.Paragliders)



<http://twitter.com/SWINGparaglider>

## SWING TV



On SWING TV, SWING puts official video footage and footage by pilots, under these categories:

- Paragliding
- Speedflying
- Accessories
- Video footage by pilots



<https://vimeo.com/SWINGparaglider>



<https://www.youtube.com/channel/UCVituxPWODYREVJrIsFbfbA>

Now we wish you

A lot of fun and many inspiring flights with your ARCUS 2 RS

SWING Team

## Appendix

### Addresses

#### **SWING Flugsportgeräte GmbH**

An der Leiten 4  
82290 Landsberied  
Germany

Tel.: +49 (0) 8141 32778 - 88

Fax: +49 (0) 8141 32778 - 70

Email: [info@SWING.de](mailto:info@SWING.de)

[www.SWING.de](http://www.SWING.de)

#### **Paraglider recycling**

SWING Flugsportgeräte GmbH

- Recycling Service -

An der Leiten 4  
82290 Landsberied  
Germany

#### **DHV**

Am Hoffeld 4  
Postfach 88  
83701 Gmund am Tegernsee  
Germany

Tel.: +49 (0) 8022 9675 - 0

Fax: +49 (0) 8022 9675 - 99

Email: [dhv@dhv.de](mailto:dhv@dhv.de)

[www.dhv.de](http://www.dhv.de)

#### **AIR Turquoise**

Route du Pré-au-Comte 8

1844 Villeneuve

Switzerland

Tel.: +41 (0)21 965 65 65

<https://para-test.com>

#### **DULV**

Deutscher Ultraleichtflugverband e.V.

Mühlweg 9

71577 Großerlach-Morbach

Germany

Tel.: +49 (0) 7192 93014 - 0

e-mail: [info@dulv.de](mailto:info@dulv.de)

[www.dulv.de](http://www.dulv.de)

#### **Versions**

Version: 1.0

Date: 11.01.2021

First version of the Instruction Manual

