Salvage SQ

OPERATING & PACKING INSTRUCTION
FOR EMERGENCY SYSTEM
SALVAGE SQ

Version 1.0 Stand 09.2022

Contents

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01. FOREWORD

Dear Customer,

thank you for choosing a MAC PARA product! With the Salvage SQ you have not only acquired one of the most modern and innovative rescue equipment, you also opted for a brand that is committed to the sustainable use of the earth's resources. The ecological balance of our products is our priority.

This manual provide important information on how to maintain, throw and repack your rescue parachute. Please read this manual carefully before installation! It has been written to serve as a comprehensive guide for the proper handling of your reserve parachute. If you have any questions related to the use of this rescue system, please contact MAC PARA directly. If you need professional packing or repair service, please contact your local dealer or MAC PARA.

The use of a rescue system is complex and it requires some practice to complete a successful rescue deployment. For this reason, we recommend intense workout for the use of the Salvage SQ. A perfect way for those who can learn only by themselves by repeating the exercises in the event of an emergency in the prevailing difficult condition and react correctly.

We hope and wish you that the Salvage SQ must be used as little as possible. If nevertheless, the situation requires it, it should not be hesitated and the rescue device should be activate immediately. For those rare moments we have invested all our knowledge and our intelligence, so you can count completely on the reliability of the Salvage SQ.

For more information about this and other MAC PARA products, please visit www.macpara.com.

We wish you great flights and always safe landings.

02. INTRODUCTION

2.1 Safety Instruction

The use of this rescue system is at your own risk. The manufacturer cannot be held liable for any personal injury or material damage related to the use of this reserve system. The Salvage SQ is not suitable for speeds in excess of 32 m/s or 115 km/h. The parachute, the suspension lines and their connection are not designed for an abrupt opening, because the necessary shock absorbers are missing. Due to its design characteristics it is not suitable for the free-fall!

An unauthorized use is prohibited. It is essential to ensure the proper installation of the Salvage SQ in the harness. In the direct connection, a compatibility test must be carried out by an entitled person, to exclude possible non-compatibility between the harness and rescue device.

Only a correctly mounted rescue equipment can function properly in case of an emergency and thus contribute to safety. In case of a release of the rescue device above water, for example, as part of safety training, should pay attention to the fact that a harness foam protector generates positive bouncy and can bring the pilots in the „head-down“ position in the water.

2.2 Intended Use

This rescue systen Salvage SQ has been developed and constructed exclusively for the paragliding sport. The deployment of the rescue device is carried out manually and is used for the paraglider pilot and provide if need it an emergency descent. The Salvage SQ emergency parachute is not steerable.

03. RESCUE CANOPY SALVAGE SQ

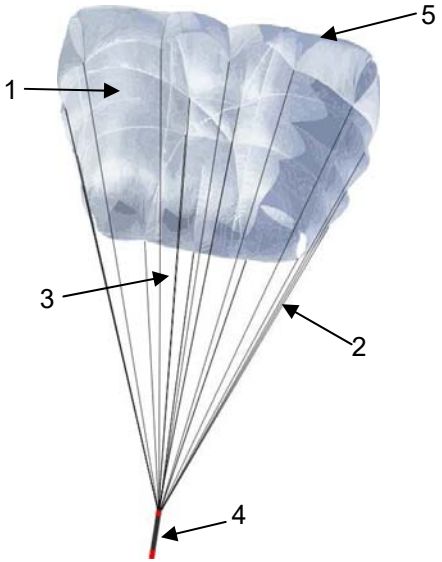
Through to intensive development work, we have succeeded to develop a square canopy for the paragliding sport. The Salvage SQ is easy to pack, with a small size and weight and has very high pendulum stability. Despite a high maximum towing capacity, we were able to achieve very good sink rate.



3.1 The construction

Legend:

1. Canopy
2. Lines
3. Centre lines
4. Main risers
5. Packing loops (on the top side)



We only use the highest quality materials in order to achieve a unique product. All materials used are manufactured in Europe. Sophisticated and modern production methods after ISO 9001 guarantee the best quality and long life. Due to the low pack size the compatibility is guaranteed with most harnesses.

3.2 Necessary documentation

- Operation Manual
- Inspection record

3.3 Components of the delivery

- MAC PARA Salvage SQ Rescue
- Salvage SQ Inner container (Tube container or 4-Leaf Container)
- Salvage SQ Pack instructions (in the operations manual for free download)
- Salvage SQ Inspection record
- Salvage SQ Operation manual
- The operation manual is available for download at www.MACPARA.com

3.4 Quality assurance

The MAC PARA rescue devices go through a step by step control during the whole production. After every step, the product is accurately checked and only after a successful pass of the test the following step will be started. The fabric, the straps, lines and also the sewing machines are verified before use. Continuous quality controls of the production process ensure an error-free production.

Each rescue unit is subjected to a strict final inspection before it leaves our factory.

3.5 Materials used

The canopy is made of cloth specifically engineered for this application. The cloth is treated with a material that prevents sticking, to facilitate smooth and rapid deployment. This meets the required strengths, convinced by good workmanship and promises a longer life. The main seams are including a webbing, which enhance the strength of the canopy.

The lines are made out of high-strength Dyneema for an enormous weight reduction. Only the middle lines are made out of polyester. The connection of the lines to the canopy are also made out of polyester and corresponds to the international parachute workmanship.

3.6 The Components

The Salvage SQ consists of 4 components.

- the square form canopy
- the suspension lines (sides and middle line)
- Main riser
- Innercontainer

3.7 Certification

The rescue system Salvage SQ by MAC PARA is certified EN and LTF to the EN 12491:2001 and LTF 91/09 standards. The approval is valid only in use with the original MAC PARA Tube or 4-Leaf innercontainer. Use of any other inner container may produce different results, including failures. When using a Salvage SQ in the context of a non-original innercontainer please note the corresponding Release Note in the appendix of this manual.

3.8 Operational limits

WARNING!

The rescue systems Salvage SQ is not suitable for use at speeds in excess of 32 m/s (115 km/h).

MAC PARA require a mandatory, one-year repacking interval for your parachute reserve. Shorter intervals than the one-year minimum requirement, to more often air out and repack your rescue, helps to keep your rescue in good condition.

However, we recommend every 24 months a review of the rescue system.

After each case of a real emergency opening the Salvage SQ rescue device should be checked by the manufacturer. Permissible operating time: 10 years in compliance with the pack intervals and storage regulations. An extension up to 12 years is possible after an inspection of the manufacturer.

04. SPECIFICATIONS

	Salvage SQ 110	**Salvage SQ 130**	**Salvage SQ 160**
Min. Load [kg]	73 kg	87 kg	106 kg
Max. Load [kg]	110 kg	130 kg	160 kg
Weight of the parachute [kg]	1,05 kg	1,20 kg	1,70 kg
Surface [m²]	23,0 m²	27,3 m²	40,0 m²
Sink rate at max. Load [m/s]	EN 5,49 m/s	EN 5,49 m/s	EN 5,35 m/s
Test method	LTF / EN	LTF / EN	LTF / EN
Pattern test number	EP_346.2023	EP_347.2023	EP_348.2023
Volume [cm³]	2.90 incl. lines	3.70 incl. lines	5.30 incl. lines

05. RELEASING OF THE RESCUE SYSTEM

The rescue system is very often literally the lifesaver the “Second Chance“ for the paraglider pilots. In the close flown airspace of many flying areas a collision should not be underestimated as a danger on good flying days. Collisions with other aircraft are one of the principal reasons to pull the rescue parachute. Disturbance in the glider as cravats, which leave the glider in spirals, fast twisted rotation movements or line breaks that make the steering of the glider impossible are other good reason for throwing the rescue.

Before each flight, check all straps securing the rescue and the front container to the harness (where applicable). Ensure that the container is securely closed, and visually inspect that the safety pins are properly seated & secured and that there is no damage.

5.1 Deployment oft the rescue canopy

You grab the handle of the rescue and throw the canopy with a strong lively movement slightly backwards. The more hard the movement precipitates, the faster the lines stretches themselves and pulls the canopy out of the container.

5.2 After the opening

When the reserve opens (usually behind the pilot) the glider is momentarily unable to fly, any prior rotation stops immediately. The rescue rises above the pilot, the glider dives forward or sideways. Now you must immediately attempt to deform the glider strongly (B- or C-Stall, or pull one line in) that the glider disturbs the rescue in his movements as little as possible. If one does nothing at all, the glider rises above the pilot, the rescue shifts backwards and cannot carry properly. This can occur to the dreaded scissoring position (Down Plane) when the glider and the rescue are at an angle of 45º to each other. The rescue canopy carries now only one part of the load, the rate of descent is dangerously high. Try to deflate the glider and don´t let it fly anymore (B- or C-Stall, pull one line in). If the paraglider flutters only like a flag upwards, the rescue canopy can carry widely undisturbed and freely of pendulum.

5.3 The scissors position

The Salvage SQ is extremely pendulum stable as a square canopy can be. Nevertheless, the danger of a scissor position (Down Plane) should be reduced by stabilizing the paraglider or its retraction.

A scissor position increases the rate of descent and produce an oblique pilot position when landing and increases the risk of injury!

5.4 Landing with the rescue system

Especially when triggered at low altitude the upright position in the harness is important. If you have a shoulder mount to the harness, it usually brings you in an upright position. It is essential to ensure that the paraglider is not deforming the rescue system just before the ground.

It is important to note the following when landing on the rescue:

- Upright pilot position
- Legs together and knees slightly bent
- be ready to roll over yourself

5.5 Potential errors and hazards

Error in the Deployment	Rescue response/hazard:	Pilot reaction:
Release handle can not be achieved	Rescue can not be triggered	Compatility-Check after each complete new
Closure on the outer container can not be opened	Rescue can not be triggered	C-Check after each complete new installation
Inner container is not thrown away aggressively	Rescue does not open or very delayed	strongly pull on the lines or riser of the rescue, pull
No deformation of the paraglider	Scissor position, strong commuting, uncontrolled impact	Deform the gilder, get rid of the glider (Quick-Out)
Too much concentration on the glider, pilot forget the upright position	pendulum, uncontrolled landing	Occupy upright pilot position, prepare for landing
During the landing legs not together, wrong pilot position	Uncontrolled landing	Ouch!!!

06. ATTACHMENT TO THE HARNESS

The Salvage SQ is only available with the short bridle option. The short bridle option is for harnesses that already have reserve bridles in place.

The Salvage SQ must be connected with a carabiner. Direct connection between the main riser and the harness bridle is not recommended, as a wrongly installed knot or shock opening could significantly weaken the system depending on the configuration!

When using a connection carabiner the breaking load of the carabiner must have a min. of 2400 daN. The carabiner has to be secured on both sides with rubber bands or O-rings by means of a Larks Head knot, with fixing tape or a neoprene jacket to protect against fraying and abrasion.

It is important to ensure that the connection is centred, that is, the two connecting lines leading to the shoulder straps are of the same length. If the harness does not have an integrated/ designated attachment points for the reserve chute on the shoulder straps, then the reserve chute connecting line can, alternatively, be attached to both main carabiners. If using the main carabiners, again ensure that the connection is centred(equidistant connecting lines).

COMPATIBILITY TEST

Each new combination of harness and rescue has to be checked (Compatibility Check) after the first packing by the manufacturer or by an expert or compatibility-testing authority. Please refer to the harness or the front container user's manual if available. This requirement is necessary to make sure that no unsuitable harnesses with integrated outer containers are used in combination with our reserve. Deploying the rescue system has to be possible out from each flying position according with the requirements of the building regulation. It should be noted that the release force of 7daN is not exceeded.

Please refer to the harness or the front container user's manual if available. This requirement is necessary to make sure that no unsuitable harnesses with integrated outer containers are used in combination with our reserve.

Be careful with back protector manipulation in your harness when the rescue parachute is already installed. Depending on the design of the harness, protector positioning or the rescue parachute container may affect the ability to easily pull the rescue parachute out. After any changes it is absolutely essential to do a simulated deployment under a static swing, ensuring that the parachute release system operates correctly and the parachute comes out easily.

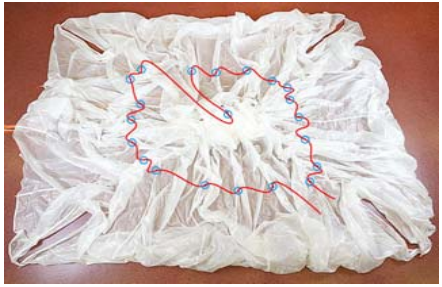
07. PACKING INTERVALL

Ideally our parachute should be repacked every 6 months, preferably by a qualified professional to ensure best operation. Maximal interval is 12 months. It makes sense when you throw the rescue package for training on this occasion in a clean, dry space.

Before the rescue is repacked it must be subjected to a visual inspection by the packer. The reserve parachute must therefore be aired at a humidity of 60-65% for 24 hours. The packing shall be done as possible on a packing table, but at least on a clean, antistatic surface. The following photos below are from packling the Salvage SQ. We remind you that you fly at your own risk. This also applies to the use of this life-saving device.

08. PACKING MANUAL

Before you start to pack, the Salvage SQ should be checked for any damage to the canopy, the lines and the main riser. The lines should be checked for proper performance and to unravel if necessary. The Salvage SQ is a square canopy and has four corners.



1) String the packing loops on a line.

2) Move packing loops to get them closer.

3) Attach the line on a fixed point.

4) Separate the lines of the two halves of the canopy on each side of the centre thicker white lines.

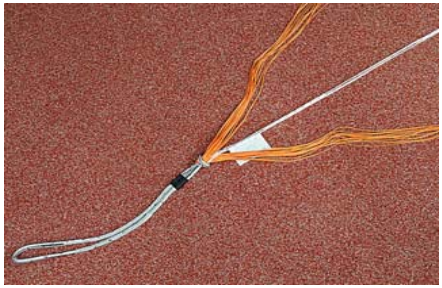
5) When you put the main rescue lines under tension, the 4 corner lines are loose.

6) Separate the right panels apart from the left panels.

1) String the packing loops on a line.

2) Move packing loops to get them closer.

3) Attach the line on a fixed point.



4) Separate the lines of the two halves of the canopy on each side of the centre thicker white lines.

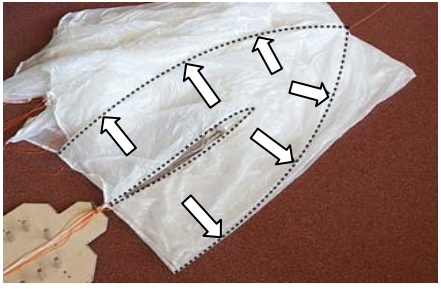
5) When you put the main rescue lines under tension, the 4 corner lines are loose.

6) Separate the right panels apart from the left panels.

7) The bottom panel should be sorted out to the right.

8) It is the 1st panel on the right.

9) 1st & 2nd can be laid in perfect rectangles.



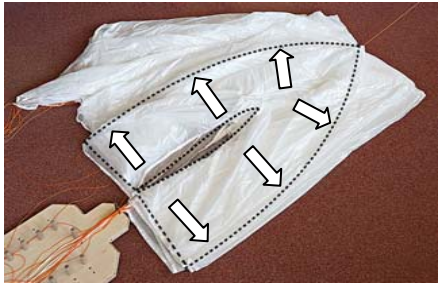
10) 3rd & 4th panels are corner panels; stretch out those two panels to the right and to the left perfectly balanced.

11) Pull the upper edge of the corner slot towards the top of the canopy to stretch the corner line.

12) Bring the 4th panel to the right.

13) 3rd and 4th panels do have a peculiar shape (see dashed line).

14) 5th, 6th, 7th & 8th panels can be laid in perfect rectangles.



15) 9th & 10th panels are corner panels again; stretch out those two panels to the right and to the left perfectly balanced.

16) Pull the upper edge of the corner slot towards the top of the canopy to stretch the corner line.

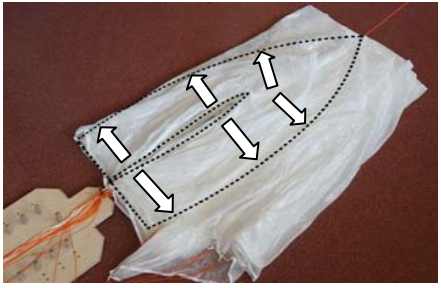
17) Bring the 10th panel to the right.

18) 9th and 10th panels do have a peculiar shape (see dashed line).

19) 11th & 12th can be laid in perfect rectangles; they are the last panels on the right side.

20) Bring all the remaining left panels to the right over the right panels. **Left panels are sorted out exactly like the right panels; visually speaking, the look of the panels**

21) 1st & 2nd panels can be laid in perfect rectangles.



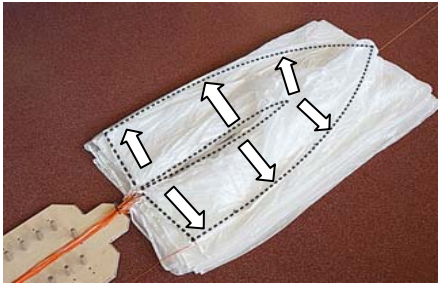
22) 3rd & 4th panels are corner panels; stretch out those two panels to the right and to the left perfecly balanced.

23) Pull the upper edge of the corner slot towards the top of the canopy to stretch the corner line.

24) Bring the 4th panel to the left.

25) 3rd and 4th panels do have a peculiar shape (see dashed line).

26) 5th, 6th, 7th & 8th panels can be laid in perfect rectangles.



27) 9th & 10th panels are corner panels again; stretch out those two panels to the right and to the left perfectly balanced.

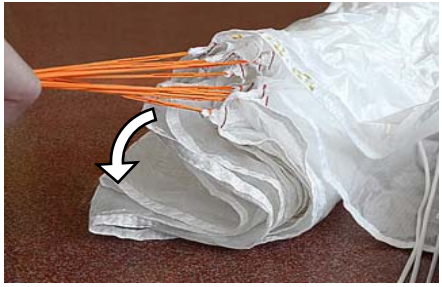
28) Pull the upper edge of the corner slot towards the top of the canopy to stretch the corner line.

29) Bring the 10th panel to the left.

30) 9th and 10th panels do have a peculiar shape (see dashed line).

31) 11th & 12th can be laid in perfect rectangles; they are the last panels on the left side.

32) Z-coil the left panels under the middle of the canopy.



33) Front view of the Z-folding of the left panels.

34) Z-fold the right panels over the middle of the canopy.

35) Canopy is now narrower and its width matches the width of the inner container.

36) Position the inner container with the elastic towards the top of the canopy.

37) Slide the inner container under the bottom of the canopy.

38) It is absolutely essential to remove the line from packing loops.

39) Z-fold the canopy lengthwise over the inner container.

40) Z-folded canopy on the inner container.

41) Close the flap of the inner container with the elastic and the two side flaps.

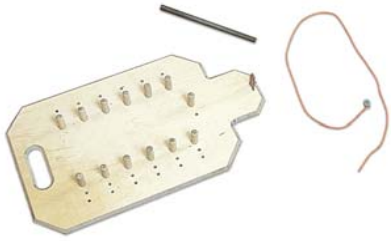
42) S-coil the lines; the loops of the coiled lines are secured in two groups with rubber bands.

43) Approx. 1,5 m of the lines should remained uncoiled.

44) Stow the S-coiled lines in the front of the inner container.

45) Close the 4th flap of the inner container and secure it with loop of the lines; the length of this loop must be 4 cm.

46) S-coil the remaining length of the lines on top of th–e inner container.



47) Check that you have all the hardware that has been used for packing and that none remained in the packed rescue.

09. MAINTENANCE

The canopy is to be stored in a clean and dry area. Avoid prolonged exposure to direct sunlight. If it gets wet, dry the canopy and lines thoroughly and immediately to prevent damage caused by mould. Contamination by oils, or any other chemicals could significantly reduce the load stability of the life- saving system. The manufacturer must inspect contaminated canopies. The container can be cleaned (WITHOUT the canopy inside!) using water and a mild detergent followed by a thorough rinse and drying. Use only clean water without soap to clean the canopy and lines.

10. REPAIRS

All repairs must be carried by the manufacturer. Any unqualified repair might lead to a system failure.

11. SPARE PARTS

Your Salvage SQ reserve parachute consists of many high-quality, long-life components. When replacing parts (lines, risers, fabric panels, etc.), only original parts should be used. In addition to the continued airworthiness of your reserve parachute, this is important for your safety as well.

12. WARRANTY

The reserves are guaranteed for 2 years against any production fault since the date of purchase. The warranty does not cover daamages that was caused by misuse, by neglecting the regular maintenance, or in case of overloading the reserve chute.

13. DISPOSAL

Even the best products have a limited service life, and once your reserve parachute reaches this point, it must be disposed of properly. Please make sure your reserve parachute is disposed of in the correct environmental manner, or send it back to MAC PARA for correct disposal.

If you have any questions regarding the information in this manual, contact your MAC PARA dealer.

14. RISK

The compatibility of a harness with integrated / solid inner container to an external emergency equipment must be guaranteed by the manufacturer of the harness and is tested by internal tests with different bulky containers. The opening processes of the rescue device are dependent on the type and size of the inner container. There is the possibility that the rescue equipment has a slowed-down opening or not even open in use of a smaller inner container or inner container of other design.

In the rescue manufacturing we take care that different materials are handled separately. It is possible that minimal parts of this coating are solved and get transferred on the fabric if the lines and the fabric are packed together. This can lead to bonding and thus a delayed opening. Similarly, a defined packing method is recommended which is not useful or possible in each inner container from other brands.

Changes that differ from the original packing method or the packaging size can increase the opening time and reduce the opening quality.

15. IMPLEMENTATION AND INSTALLING

The implementation and installation of a MAC PARA rescue unit in the inner container of a third-party may be made only by trained personal by MAC PARA. During the conversion and installation of the rescue the manual of the rescue as also of the harness - or inside container manufacturer - has to exist and the corresponding installation and pack instructions need to be followed. The conversion in the non-original inner container is to note in the packing ID and signed by the pack manager.

16. CHANGES | PACKINTERVALL | QUALITY

We would like to point out that we pay much attention to a uniform development of our rescue systems. This refers to all system details and also includes the inner container. Who changes the inner container on our rescue equipment or remodels, change the quality of opening under certain circumstances. We definitely recommend a proper release during a compatibility-check. Take special care if the lines packed together with the canopy in the container and recheck the eventual problem explained in point 2. On the usual precautions (dry storage, no com- pact packing, no moisture in the system etc.) in the handling of harness, inner container and rescue device should be placed special emphasis.

The operating manual as well as additional information can be found on www.MAC PARA.com for Download file.

INSPECTIONS AND REPAIRS

Date:	Repairs	Proof of installing into the harness or into the outer container.	Operated by (Name) :	Signature:

EMERGENCY OPENING REPORT

Type of Parachute:……..……

Glider used:……..……..……..

Damage to Parachute:……..……..

Damage to glider:……..……..

Date:…… Time:……..……..

Conditions:……..……

……

……

……

Site:……..……..

Pilot's qualifications and experience:……..……..

……

Description of incident:

……

……

……

……

……

……

Name of the pilot:……..

Address:……

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……

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TYPE OF RESCUE SYSTEM

SALVAGE SQ 110 ☐

SALVAGE SQ 130 ☐

SALVAGE SQ 160 ☐

Serial number:

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Inspected on:

_____

Inspected and folded by MAC PARA

(Max. Pack interval: 12 months)

Confirmation by dealer:

_____

MAC PARA

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