



OPERATING & PACKING INSTRUCTION  
FOR EMERGENCY SYSTEM  
AEGIS SQ

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### MAC PARA COMMUNITY



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Dear Customer,

thank you for choosing a MAC PARA product! With the Aegis 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 Aegis SQ 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 Aegis 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 Aegis 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 Aegis SQ.

For more information about this and other MAC PARA products, please visit [www.macpara.com](http://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 Aegis 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 Aegis 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 system Aegis 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.

Through to intensive development work, we have succeeded to develop a square canopy for the paragliding sport. The Aegis 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.

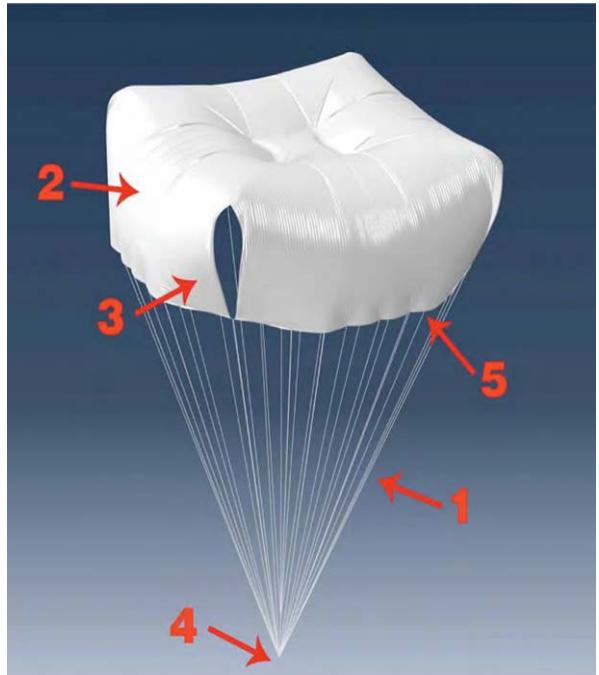


### 3.1 The construction

Legend:

1. Suspension lines
2. Canopy
3. Corner openings
4. Main Riser
5. Base

We only use the highest quality materials such as Cousin-Trestec lines or Liros and nylon Fabric from UTT 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 Aegis SQ Rescue
- Aegis SQ Inner container (Tube container or 4-Leaf Container)
- Aegis SQ Pack instructions (in the operations manual for free download)
- Aegis SQ Inspection record
- Aegis SQ Operation manual
- The operation manual is available for download at [www.MAC PARA.com](http://www.MAC PARA.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 materials used were selected very carefully and under the strictest quality standards. So we choose a 27g uncoated rip-stop nylon fabric from UTT. 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 Aegis 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 Aegis 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 Aegis 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 Aegis SQ 105 and Aegis SQ 140 are not suitable for use at speeds in excess of 32 m/s (115 km/h).**

Max. in every 12 months the Aegis SQ rescue equipment need to aired and repacked. Currently, there is no verification requirement for rescue equipment.

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

After each case of a real emergency opening the Aegis 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

	Aegis SQ 105	Aegis SQ 140
Min. Load [kg]	65 kg	85 kg
Max. Load [kg]	105 kg	140 kg
Number of panels	20	24
Weight of the parachute [kg]	1,45 kg	1,95 kg
Surface [m <sup>2</sup> ]	34,5 m <sup>2</sup>	44 m <sup>2</sup>
Number of lines	20	24
Number of middle lines	1	2
Sink rate at max. Load [m/s]	EN 5,49 m/s	EN 5,39 m/s
Test method	LTF / EN	LTF / EN
Pattern test number	LTF RG 065.2012	LTF RG 068.2013
Pattern test number	EN EP 128.2015	EN EP 129.2015
Container dimensions [cm]	L 27   W 25   H 9,5	L 28   W 26   H 11,5
Volume [cm <sup>3</sup> ]	4.980 incl. lines	5.600 incl. lines
Height [m]	6,5 m	7,3 m

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.

### 4.1 Deployment of 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.

### 4.2 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 45° 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.

### 4.3 The scissors position

The Aegis 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!**

### 4.4 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

## 4.5 Potential errors and hazards

Error in the Deployment	Rescue response/hazard:	Pilot reaction:
Release handle can not be achieved	Rescue can not be triggered	Compatibility-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 glider, 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!!!

Before each packing the parachute must be inspected by the person who is packing it. If the rescue system has been deployed in an emergency situation or during a safety training, it has to be re-checked by the manufacturer or by an authorised service centre. It must also be thoroughly inspected by a competent person after every larger stress exposure (e.g. a tree landing).

### 5.1 Behavior if damaged

If a check of the rescue system found some damage which affect the airworthiness of the device, the rescue system has to be send to the manufacturer for repair. This also applies to damages whose impact on the airworthiness of the system and cannot be uniquely determined.

### 5.2 Storage

A rescue device exists to save the life of the owner. It needs careful maintenance and care. UV radiation, moisture and chemicals are the worst enemies of your Aegis SQ rescue system. Oils, greases, acids and dyes must not be stored in close proximity to the rescue system. Avoid unnecessary burdens and let your Aegis SQ never unnecessarily lying in the sun. The rescue equipment should be dried in clean, dry and dark rooms. Rescue packages that are no longer used should be stored loosely rolled in a bag.

### 5.3 Cleaning and drying

Dirty canopies and containers can be washed with clean clear water. Acids and mildew can affect the strength of the components. Such polluted parachutes have to be sent to the manufacturer for investigation and repaired if necessary.

### 5.4 Repairs

The manufacturer or an authorised service centre must perform all repairs. Spare parts are available by the manufacturer.

### 5.5 Correct disposal of the rescue equipment

As an environmentally conscious manufacturer of rescue equipment we pay great attention to produce our products Eco social tolerated. The material we use in our products is evaluated according to environmental criteria and subject to constant control. For the proper disposal the steel fittings should be separated at the metal disposal point. The canopy, the lines and straps can be disposed with household waste.

## 07. ATTACHMENT TO THE HARNESS

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

**The Aegis SQ must be connected with a carabiner or by looping through the V-line to the harness.**

When using a connection carabiner the breaking load of the carabiner must have a min. of 2400 daN.

Each new combination of harness and rescue has to be checked (Compatibility Check) after the first packing by the manufacturer of the harness or by a trained and appointed person. 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.

## 08. 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 packing the Aegis SQ. We remind you that you fly at your own risk. This also applies to the use of this life-saving device.

## 09. PACKING MANUAL

Before you start to pack, the Aegis 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 Aegis SQ is a square canopy and has four corners. One of these corners is at the bottom when folding, one corner on the left and right and the last above.



Before each packing slide on the packing loops on a line (packing cord). Now you pull the whole rescue under tension, all the fabric and lines are under tension except the 4 corner lines.



The rescue canopy should now be well positioned.

10 panels (blue arrows) lay to the left and 10 panels (green arrows) on the right. The corner line with the two opposite (green and blue) arrows should be located down on the bottom.

**NOTE: There are 10 panels at the Aegis SQ 105 and 12 panels at the Aegis SQ 140.**



Now you have to arrange panel by panel to the right (green arrows). The panels should be as wrinkle-free as possible. Note that the lines remain pooled on the basis below. The first panel has come to be tapered at the top.



After follows three rectangular panels which will be placed from the left to the right side (Aegis SQ 105).

**NOTE:**

**At the Aegis SQ 105 there are three panels and on the Aegis SQ 140 there are four panels.**



The following panel and as the same time the middle panel on the green side is the corner panel and should be placed as a triangle. Here the slot (corner of the rescue), is visible on the right side. This panel is wider than the underlying panels. The out looking area is inserted later on the S-turns.



Keep on folding the panels on the green side till the panels with the two arrows pointing to each other is visible. Now we can fix the right side panels with some sand bags, this recommended especially for less experience



Then we must move the left (blue arrow) panels over to the right ones (green arrow).

All panels are now right.



Same like we did with the right side panels now the left ones with the blue arrow must be placed according to the same procedure as the right side, clean and wrinkle-free. Beginning with the first at the bottom.



Same as on the right side with the green arrows the panels are defined with the blue arrows. There are three rectangular panels before the lateral corner panel. It should be noted that the lines must be located in the centre of the base bellow. Here you a can help yourself with sand bags.

**NOTE: The Aegis SQ 105 has three panels and the Aegis SQ 140 has four panels.**



The fourth panel is a blue corner panel as already on the right side and is accordingly also laid down as flat as possible.

**NOTE: In the Aegis SQ 105 it is the fourth panel and on the Aegis SQ 140 it is the fifth panel.**



The other panels are placed clean down till the top corner panel is achieved. This panel is recognizable by the two arrows pointing to each other. The Aegis SQ is now symmetrical and nicely folded in front of you.



The base can be seen below with the centrally located lines, all panels with the blue arrows are left and all panels with green arrows are the right of the lines. In the middle are the arrows which are pointing to each other.



In the center of the canopy the middle line and the top should be recognizable through the slot.



Similar to round canopies the rescue is now folded with the help of S-turns to the width of the inner container.



The corner panel is simply folded back to the left side.



The entire parachute is now rotated around its axis 180° to the left. This act is the most difficult and it is easier if two people working in sync for the rotation. At the base edge the two arrows pointing away from each other are now visible.



The left side panels with the green arrows are defined as S-curve to the right on the inner container width. The lines should now be centrally located in the middle of the rescue again.



The triangle panel gets folded to the left on top to reach the inner container width. The Aegis SQ is now longitudinal S-folded symmetrically in front of you. The lines are in the middle of the base edge.



The packing line for holding the packing loops together can be removed now. It is important that this line is removed completely. Otherwise it will prevent the opening of the Aegis SQ!



The Aegis SQ should now be placed with narrow S-curves to a tower. The width of the S-turns should be about 11 - 140 cm wide.

The length of the S-curves is depending on the size of the container. The length of the inner container from the Aegis SQ 105 and 140 are different.



The lines are collected in S-folds so that it gives about 3 - 4 line bundles. Again, care should be taken that the excess of the line loops behind the rubber are kept as small as possible.



The inner container is placed on top of the existing S-turns. The slot of the inner container should look towards the lines.



It is important that the base edge of the Aegis SQ is placed at the top of the 4-leaf container facing towards cover leaf No. 4.



The lines are collected in S-folds so that it gives about 2 - 3 line bundles. Again, care should be taken that the excess of the line loops behind the rubber are kept as small as possible. From the last line groups to the main riser should be left 40 cm of lines for closing the cover part.



The line bundles are stowed in the pocket of the line bag of the inner container.

From the last line groups to the main riser should be left 40 cm of lines for closing the cover part.



The leaves 1 - 4 of the inner container will be closed with the black rubber line loop in the correct order.

The black rubber line is fixed on leaf no. 1, leads through the grommet and makes a line loop. The leaf no. 1 with the black rubber line loop is placed first on the canopy.

You can use a plastic line for closing the inner container.



Lead the black rubber loop through the grommet of the leaf no. 2.



Lead the black rubber loop through the grommet of the leaf no. 3.



Then lead the black rubber loop through the grommet of the leaf no. 4.



Use the remaining free line to secure the black rubber loop of the inner container.

The Aegis SQ is now ready for installation into the harness.

The connection of the Aegis SQ to the harness shall be made due following the recommendations of the harness manufacturer (Harness manual).

The riser of the Aegis SQ should be connected to the suspension point of the harness. For the connection of the handle there are three loops on the outside face of the inner container.

## 10. RELEASE

Release of MAC PARA rescue equipment for external containers (harnesses with integrated reserve container)

status date 08 | 2019

## 11. CONTENT

This release is valid for all MAC PARA Aegis SQ rescues in conjunction with non-original inner containers.

**WARNING** — Use of this parachute with any alternative inner container: the speed of opening and opening shock test has been completed using the inner container supplied. Use of any other inner container may produce different results (including failure).

## 12. 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.

The original Aegis SQ container have a separate line compartment for the S-loop line packages for a defined opening sequence. In a container without a separated line compartment the throwing power slows down by the early release of the entire rescue system. The MAC PARA containers provide a maximum of throwing power and quality of defined opening. This ensures a faster opening. In addition, Dyneema lines are installed in most modern rescue equipment. These lines are coated with a polyurethane resin.

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.

## 13. 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.

## 14. 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](http://www.MAC PARA.com) for Download file.

## INSPECTIONS AND REPAIRS

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

# 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:.....

.....

.....

.....



**TYPE OF RESCUE SYSTEM**

**AEGIS SQ 105**

**AEGIS SQ 140**

Serial number:

.....

Inspected on:

\_\_\_\_\_

**Inspected and folded by MAC PARA**  
(Max. Pack interval: 12 months)

Confirmation by dealer:

\_\_\_\_\_



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