independence paragliding

Owner´s manual
Rescue system

Fassung 1.0 vom 20.07.2018

Trigon

Fly market GmbH & Co. KG
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Warning

It is not allowed to use this rescue parachute for skydiving!

According EN 12491: Not suitable for use at speeds in excess of 32 m/s (115 km/h)

The paragliding rescue systems of the Trigon series are certified according EN 12491 (European standard) and LTF 91/09 (German type approval).

The manufacturer can not be made liable for any possible damages to persons or material damages, which may result from this rescue parachutes in any way.

1. TECHNICAL DATA

Type of rescue parachute: paragliding rescue system Trigon 100, Trigon 125

Manufacturer:

Fly market GmbH & Co. KG
Am Schönebach 3
D-87637 Eisenberg
Tel. +49-8364-9833-0

rescue system:	Trigon 100	Trigon 125
Weight of the rescue system (kg):	1,29	1,45
Surface (m²):	32	37
Number of panels:	16	16
Total length packed: (Bridle to packing loops) (m)	8,90	9,40
Min and max. load not steered (kg)	55 -100	70 - 125
Min and max load if steered (kg) See Point 6.	55 -85	70 - 100
Sinkrate at max. load	<5,5 m/s	<5,5 m/s
Volume in Milliliter (without bridle)	3800	4300

2. Intended use

Manually released, steerable rescue system for single seated paragliders in an emergency situation while flying.

3. Operating limits

Maximum speed for usage: 115 km/h (32 m/s)
Interval for repacking: 12 month, then the rescue system has to be repacked and this repacking has to be recorded in the "Repack and inspection log book".
Due to the effect of water, sand, salt or other environmental influences may reduce the repack interval.
Interval of inspection: 24 month, then a complete inspection of the rescue system is necessary. The inspection has to be recorded in the "Repack and inspection log book".
Operational lifespan of parachute: 10 years. The lifespan can be extended for 2 more years if the rescue parachute is inspected yearly during this last two years at the manufacturer. So the total max. possible lifespan is 12 years.

4. Necessary documentation

a) Owner´s manual
b) Repack and inspection log book (with recorded repack and inspection jobs)

5. Mode of operation

During an emergency situation while flying the pilot pulls at the release handle with a firm tug. Thereby the outer container opens and the deployment bag is released. After that the rescue parachute package (which is still packed in it´s deployment bag) have to be thrown with a dynamic move into the free airspace. That means the release handle have to be thrown away together with the deployment bag!!!

The deployment bag and the bridle are designed in a way which releases the lines and canopy of the parachute not before the parachute package is thrown away.
This prevents an unintentional or too early opening of the rescue parachute. This is minimizing the danger of tangling up with the paraglider / hang glider / pilot or the reason which maybe causal for the emergency case (e.g. collision with another paraglider).
Moreover the maximum throwing speed of the deployment bag should be reached when the deployment bag leaves the pilot hand.

In general: The faster the rescue system package is thrown away, the quicker the system will open.

After the throw the deployment bag opens and releases lines and canopy. The powerful throw and/or the airstream stretches the lines and canopy now the rescue parachutes opens.

When the rescue parachute is opened completely, you first have to check the altitude above ground.
If you have still enough height you should try to make the paraglider unable to fly according to the doctrine to avoid an V-position of the paraglider and the rescue system.
If you do not have enough height anymore, just focus on the ground and prepare yourself for a landing fall.

6. Usage of steering lines

The Trigon is equipped with a system that pre-brakes the canopy after opening by shortened steering lines which prevents a forward speed.

The use of the steering lines requires a few conditions that must all be met:

After the rescue system has successfully opened in the pre-braked condition and is stable above the pilot, a sufficient altitude must be present. In addition, the paraglider must be in a stable, incapable flying position (best is, if the paraglider got disconnected by a quick out release).

If these conditions are all met, the pre-braked steering lines can be unlocked by pulling both control handles symmetrically down. The rescue system picks up forward speed by decreasing the use of the brake.
The control handles are attached to the right and left of the bridle, right above the suspension point. The steering is working by increasing the drag of the canopy, same as on a paraglider, but with a slow and damped reaction.

Attention:
When the pre-braking is released, the max. take off weight is reduced (see 1. Technical data).
If the paraglider is not in a reliable, incapable flying position or separated the pre-braked steering lines must be not released and used. If released in this condition there would be a very high possibility of a V-position of paraglider to rescue system (down plane), in combination with very high and dangerous sink rate and a without possibility of steering.
The behaviour of the Trigon with non-activated steering lines is comparable with a conventional, not steerable rescue system.

With a shoulder suspension on the harness, depending on the position of the suspension points, it can be difficult to turn the head and see the control handles. Very often, these rescue system suspension are mounted on the harness far in the back area and the position of the control handles can therefore only be felt. We recommend to test the position of the handles in advance by a suitable simulation (hang in the harness on the shoulder suspension).
The use of a front container is possible, but the bridle of the rescue system must be extended for the use on the main carabiners. Otherwise the control handles are mounted too low and a steering is not guaranteed. The extension is available as an accessory.

7. Control and Inspection of the parachute

A parachute must be controlled by a registered packer before it is repacked. After being opened during an emergency rescue, the parachute must be inspected by the manufacturer or a workshop which is authorized by the manufacturer.

A repacked parachute should undergo a release test after mounted in the outer container or harness. This ensures that the opening force to release is between 2 kp and 7 kp.

By the first assembling of the rescue system with an outer container or harness with an integrated rescue system container the functionality must be checked by an expert and must be confirmed in the inspection log book.

The inspection required after 24 months includes a complete visual examination of all components (cloth, seams, lines, bridles etc) for damage and wear. For an inspection suitable tools must be available (light table, repack tools etc).

All work must be documented appropriately.

8. Behaviour if damages are noticed

If you notice any damage at the rescue parachute, which may affect the airworthy condition of the recue parachute, you have to send the rescue parachute for inspection/repair to the manufacturer.
Also, if you are not sure about the airworthy condition in any way, you have to send the parachute to the manufacturer.

Attention: Chemicals, detergents, insects, mould stains or the like can have the same negative effects to the strength of the parts as mechanical influences.

9. Storage

Oil, grease, acid and paint should not be stored near the parachute. The storage space should be dry. Parachutes which will not be used for a long period should be opened and the canopy loosely rolled and stored in a permeable bag.
Avoid unnecessary high temperature above 60° C (e.g in a parking car)!

10. Maintenance

The lifespan and condition depends largely upon how carefully you handle and maintain your parachute. Out of this reason we recommend to control the parachute regular, at the latest if it is repacked, if there are any wears or damages.

During normal use you have to take care of the following points:

If the parachute got wet, you have to open it and dry it at a well ventilated place as soon as possible (but avoid direct sunlight!) The fast drying is important to avoid mould stains. After the parachute is complete dry it can be repacked.

If the parachute is strained more than normal (for example: a car drove over the harness in which the parachute is placed, or it maybe is damaged by a sharp object, or any other possible damage), you have to send the parachute to the manufacturer to check it.

Avoid contact with salt water, acids or other aggressive substances!

Also avoid unnecessary exposure to sunlight, cause the UV rays may damage the molecular structure of the material.

11. Cleaning

A dirty canopy and container can be carefully cleaned with clear water and a soft sponge.
Attention: Never use detergents, chemicals, brushes or hard sponges to clean the parachute! Also a cleaning in the washing maschine is not allowed.
If the rescue parachute gets in contact with salt water, you have to wash it with fresh water. A too often cleaning accelerates the ageing of the system.

12. Repairs

Repair jobs have to be done only by the manufacturer or a workshop which is certified by the manufacturer.

13. Nature and environment friendly behaviour

Please do our nature-near sport in a way which do not stress nature and environment!
Please do not walk beside the marked ways, don´t leave your litter, don´t make unnecessary loud noises and respect the sensitive balance in the mountains. Especially at the take-off we have to take care for the nature!

14. Environmentally compatible waste disposal

The materials of which a rescue parchute is made require a special waste disposal. So please send disused parachutes back to us. We will care about a professional waste disposal.

15. Spare parts / changeable parts

Beside the rubber rings the Ultra Cross series do not need any other spare parts. Only certified rubber rings with the size 25x3x1mm are allowed! This special rubber rings you can get from us very well priced.
This parachute system has been tested and found compliant using the original manufacturer's inner container. Use of any other deployment bag may produce different results, including failures!
The deployment bag is part of the rescue parachute. It´s not allowed to use an other rescue parachute deployment bag of other manufacturers, except a deployment bag described in 19.4. is used. A change to any other deployment bag will void the airworthyness of the rescue parachute!

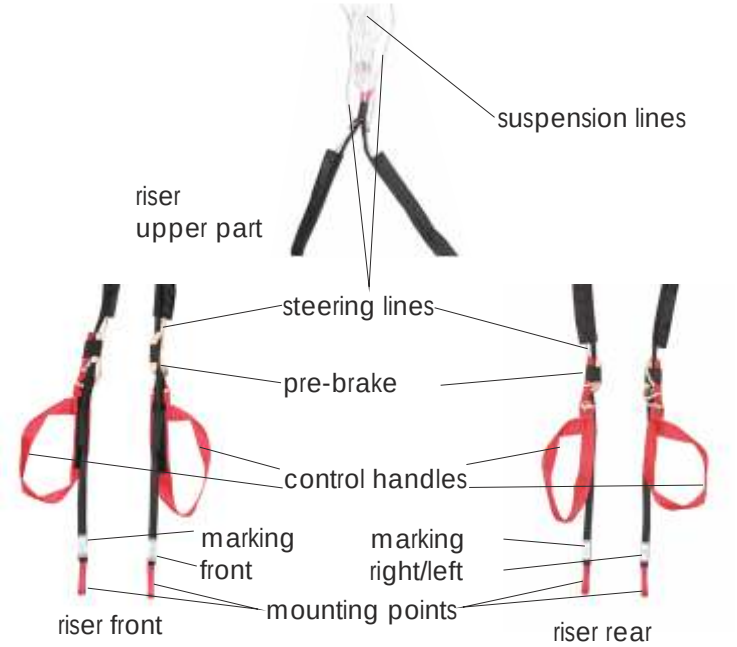
16. Structure of the parachute

The parachute structure is square and has 12/16/20/24 panels (see “technical datas”)

The canopy is made of tear restistant, high strenght nylon fabric. The main seams are flat fell seams and are reinforced by a band. The lines are sewn to the canopy and reinforced with V-tapes at the canopy. The crown is pulled down by the center lines. All lines and center lines are connected to the bridle.
The bridle has a strength of more than 2400 daN.

Overview:

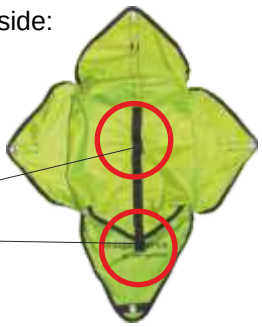
construction of riser:



The deployment bag is made of nylon fabric and gets closed at 5 points.

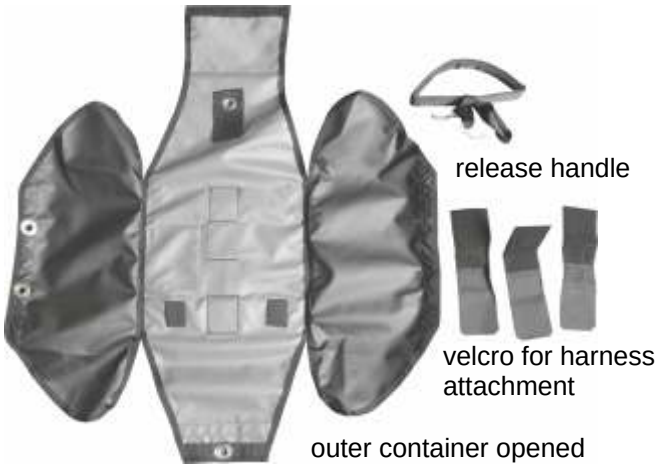
upper side:

lower side:



On the deployment bag are two loops. At one of these loops the release handle of the outercontainer or the harness is attached.

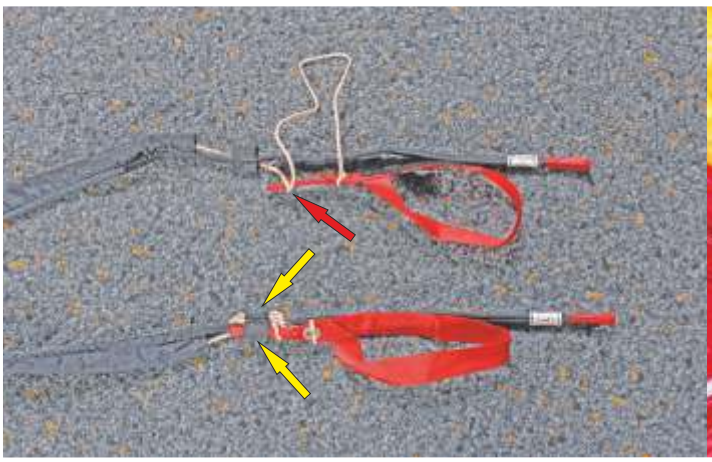
The outer container (option) is made of robust, water repellent Nylon fabric. It consists of 2 lateral flaps, the upper and lower flap, the release handle with 2 pins, which closes the container.



outer container opened

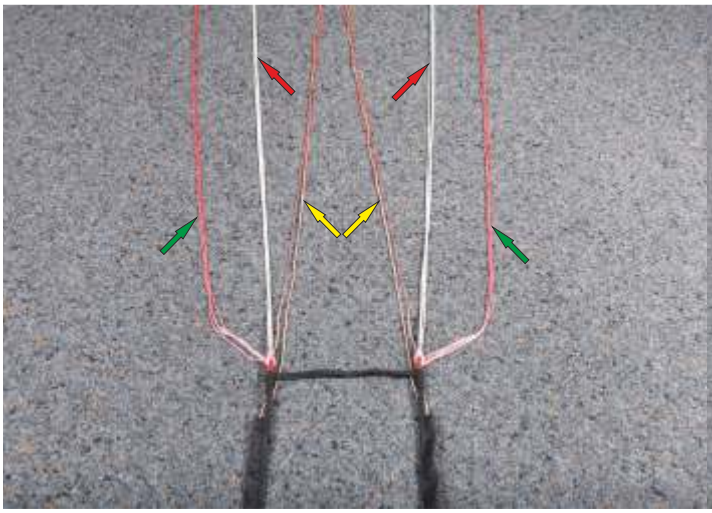
back side outer container
with attachment points

17. Packing the parachute



1. Set the pre-brake of the control handles. Teh steering lines have an eye at 40 cm. Through this the hard part of the control handle is insertet (red arrow). Insert in the fixation rubber band above control handle and jut out steering line (yellow arrow).

2. Slid on the numbered packing loops on a packing cord and hook in the packing cord. The Trigon 100 has 16 packing cords, Trigon 125 has 20.
The following pictures show a Triogon 125.



3. Separate the suspension lines from the risers and check that they are not crossed.
Steering lines and lines to the nose (yellow arrows), center lines (red arrows), lateral suspension lines (green arrows).

4. Separate the lines up to the canopy. The red nose points upwards.

5. Tighten the suspension lines and lay all panels on the right side, to that panel 10 is as shown in the picture.

6. Place panel 10 centered to the floor and arrange panel 9 to the side. Arrange upper part of panel 9 so far that it forms a trapeze.

7. Arrange panel 8.

8. Arrange panel 7. This panel is shorter!

9. Arrange panel 6. This panel is shorter!

10. Arrange panel 5.

11. Arrange panel 4.

12. Arrange panel 3.

13. Arrange panel 2.

14. Arrange panel 1 (this panel is shorter!) and place a packing weight on the hem.

15. Fold the right side on the left side.

16. Place panel 10 centered to the floor and arrange panel 9 to the side. Arrange upper part of panel 9 so far that it forms a trapeze.

17. Arrange panel 8.

18. Arrange panel 7. This panel is shorter!

19. Arrange panel 6.. This panel is shorter!

20. Arrange panel 5.

21. Arrange panel 4.

22. Arrange panel 3.

23. Arrange panel 2.

24. Arrange panel 1 (this panel is shorter!) and place a packing weight on the hem.

25. Fold right side S-shaped. (Step 1).

26. Fold left side S-shaped (Step 2).

27. Remove packing cord and place deployment bag under the canopy.

28. Fold the rest of the canopy in S-folds in the deployment bag.

29. Close inner flaps of deployment bag with suspension lines.

30. Bundle the lines in “8-shaped” hanks. Do not bundle the last 30 cm of lines.

Attention: Use new rubber rings for hanks and deployment bag everytime the parachute is packed.

31. Place „8-shaped“ hanks on the deployment bag.

32. Close the last, outer flap with the suspension lines.

18. Mounting in a container

1. Connect the release handle at the loop in the middle of the deployment bag. Place the bridle at the side of the container which you prefer.

2. Close the two lateral flaps of the outercontainer with two packing-cords and closed it with the pins of the handle provisionally.

3. Close the upper and lower flap with the pins. Remove the packing cords then!

4. Close the upper flap finally. Notice the packing in the “repack and inspection log book”.

5. To avoid an unintentional opening, the German type approval (LTF) prescribe a minimum release-force of 20 N. If the system does not have this minimum release-force, it is necessary to build in a predetermined breaking point (special thread). This have to define a minimum release force of 20 N.
The special thread which is used as predetermined breaking point must be put through the hole of the pin and around the loop as shown on the picture.
Both ends of this special thread are fixed with a knot and an additional seal.
To secure the pin it is only allowed to use certified material because if the strength of this material is too high the save operation of the rescue system is not guaranteed.
This thread is supplied by Fly market GmbH & Co. KG! Do **not use** other threads which may look the same!

19. Mounting / integration to a harness

The adaption of the Trigon on the harness is possible at the attachment points for rescue systems in the shoulder area or in the main suspension.

It must be ensured with every assembly that the risers of the Trigon are mounted in the right direction and side. For this purpose, the risers are marked with „R“ for right and „L“ for left, as well as „front“ for front.

The conection of rescue systems must always be carried out with suitable connecting links that have at in sum least a strenght of 2400 daN for both sides.

When mounting in the main suspension of the harness (for example with a separate front container), the risers have to be extended in order to enable steering with the control handles (also see the manual for the front container!!!)

When attaching to the shoulder straps, check that the harness has separate attachment points directly on the shoulder straps. Whether these are available and suitable can be seen in the manual of the harness. The use with an existing bridle of the harness is not possible!!!!
The riseres of the Trigon is normally long enough to be routed to the harness´s rescue system container. If this is not the case, then it is not possible to use the Trigon on this harness.

In general, when assebling rescue systems on / in the harness, always consult the manual of the harness or container!!

19.1. harnesses without integrated rescue system container:

If the harness does not have an integrated rescue system container use one of the outercontainer which is shown at point 15.
The outercontainer shown at point 16 has got several loops, eyelets and velcro-tapes on it´s back side to attach it at the harness. The possibilities of the attachment to the harness depends on the harness. For a correct mounting on the harness please refer to the harness manual.

19.2. Usage of a frontcontainer / outercontainer of an other manufacturer:

The use of a front container or other external container as described herein depends on whether it is suitable, has the correct size and has been type certified.
If a wrong sized container or an usuitable or not typ certified container is used, the airworthiness will expire.
For mounting the rescue system in containers of other manufacturer please refer to the manual of this container.
When using the Trigon in the main suspension of the paraglider, an extension of the risers is necessary!

19.3. harnesses with integrated rescue container:

Almost all modern harnesses have an intergrated rescue container in which a rescue system can be placed. For the correct mounting of the rescue system in such a container please refer to the harness manual.

19.4. Harnesses with combined deployment bag/release handle

WARNING — Use of this rescue system with any alternative deployment bag: the speed of opening and opening shock test has been completed using the deployment bag supplied.
Use of any other deployment bag may produce different results (including failure).

Several harnesses are equipped with a complete release handle/deployment bag system, which is adapted optimally to the corresponding harness.

When using such a system ensure that the deployment bag is compatible and tested to the rescue system used. Therefore consult the deployment bag / harness manufacturer if this deployment bag is suitable for the Trigon. The use of other (than the original) deployment bags are in full responsibility of the manufacturer. There are at least 3 things to consider in addition:

1. The permitted volume range of the handle/deployment bag system must cover the volume of the rescue system. The volume of the rescue system is to be found under 1. Technical datas.

2. In addition make sure that the deployment bag releases the rescue system without any problem. A deployment bag with 4 or more flaps (so called cloverleaf deployment bag) is normally compatible.

3. It is important to ensure that the manufacturer of the deployment bag releases the use of a steerable rescue system.

Mounting:

If the above conditions are met, the rescue system is to be packed by following No. 17 (Packing the parachute) step 1 to 26.

The remaining steps of stowing the rescue system in the harness specific deployment bag is shown in the manual of the harness.

Attention:

If the parachute is mounted to a harness or a front/outer container you have to check the compatibility. This check is only allowed to be done by therefore authorizied persons. The compatibility check have to be noticed in the “Repack and inspection log book”.
Beside some other points you have to take care particularly that the connection length of the release handle to the deployment bag is minimized. Therefore different loops are at the deployment bag where the release handle can be attached. You should always try to use the shortest possible connection to ensure that the rescue parachute can be thrown as good as possible. But you also have to take care that the release of the container is not blocked in any way. (take care that the release pin does not block!!!). Read the manual of the harness in any way.

20. Specialities for paraglider´s winch towing

For winch towing you have to consider the instructions of the harness-, paraglider- and towing release manufacturer!
If you use a frontcontainer you have to ensure that the rescue parachute can be released in every situation.

21. Pre-flight check

In addition to a normal preflight check (see manual of the glider/harness or maybe towing device), you have to check before every take off that the rescue container is closed correctly and the release handle is placed correctly.
If the rescue parachute connection bridle is removed after every flight (for example: when you use a frontcontainer) you also have to check the correct attachment of the bridle!