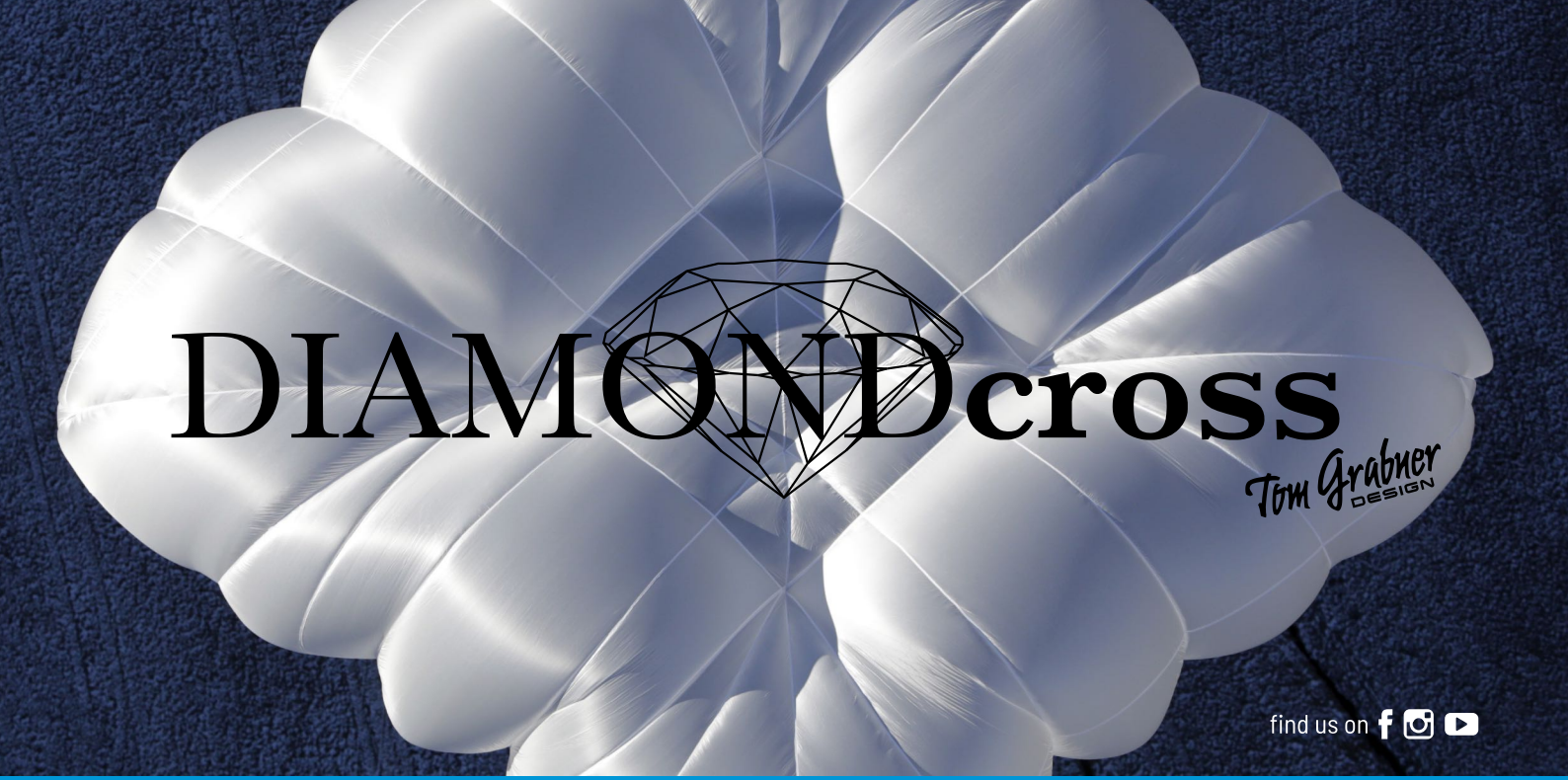


CHARLY
BEST OF AIR

THE FIRST STEERABLE CROSS CANOPY FOR EVERYONE Safe landing even with complete passivity of the pilot

CHARLY paragliding rescue systems

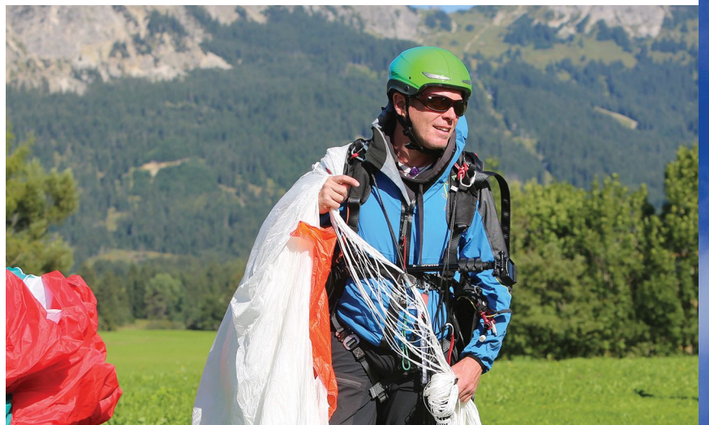
Pioneer and market leader since 1984

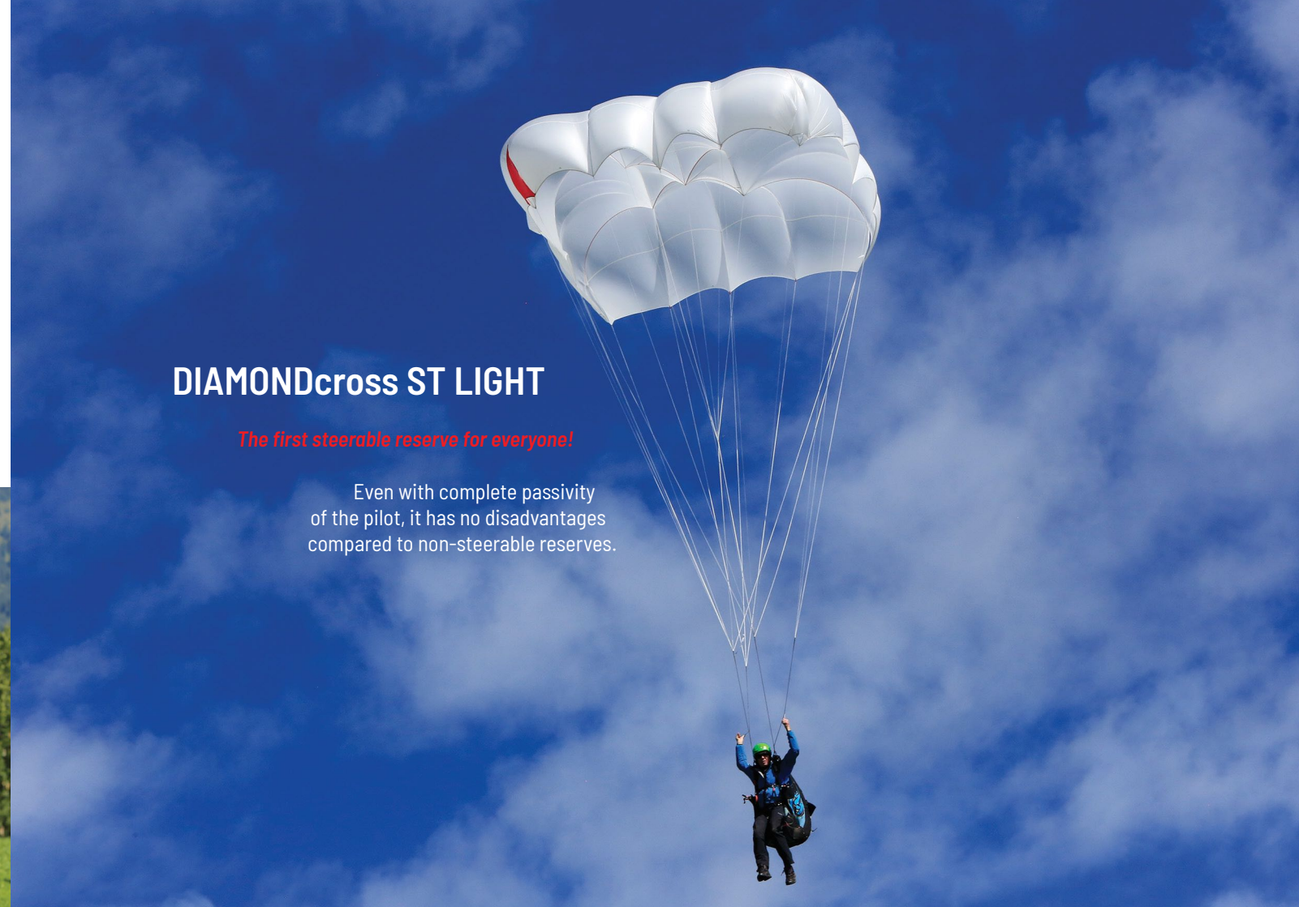
Even before it became mandatory for air sports pilots to carry a rescue parachute in 1986, CHARLY, thanks to its innovative strength, was already one of the leading suppliers of hang gliding and paragliding rescue systems. Center line construction, double canopy technology, rocket deployment, steerable reserves – CHARLY has always been among the pioneers.
With the DIAMONDcross, the first steerable cross canopy, another milestone for more safety in paragliding was achieved.

The situation in which you have to use your reserve cannot be planned. It is therefore all the more important that you carefully consider the selection of the optimal rescue equipment.
Because of its high opening speed and pendulum stability, the cross canopy shape has become widely accepted for rescue parachutes. The DIAMONDcross cross canopy with its improved inner container, fanned out base, S-shaped canopy trim and diagonal horizontal drift represents a further optimization of this concept.

You are always on the safe side with the DIAMONDcross, even if you do not make use of the option to steer. However, the ability to avoid hazards like power lines or rivers can save your life; and often, the random landing spot is not the very best landing spot...

With Tom Grabner, CHARLY was able to win a developer who combines extensive technical know-how from his many years as an aeronautical engineer with a unique wealth of practical experience. The extreme paragliding acro pilot tests his equipment under the toughest conditions. This enabled him to take rescue equipment development a decisive step further.





DIAMONDcross ST LIGHT

The first steerable reserve for everyone!

Even with complete passivity
of the pilot, it has no disadvantages
compared to non-steerable reserves.

Why have steerable reserves only been recommended for professionals?

If you can avoid power lines, rivers, rocks or roads and choose your landing spot, that is an undeniable advantage. Nevertheless, in the past, steerable rescue systems have only been recommended for professionals. Especially in the case of openings close to the ground, steerable reserves used to have more disadvantages than advantages. This was due to the fact that the early steerable Rogallo reserves had too little surface area or were not yet mature in terms of their design and, due to their tendency to downplanes and twists in certain situations, required the appropriate pilot skills. These disadvantages have been largely eliminated with modern steerable Rogallo reserves. And with the DIAMONDcross, there is now even a steerable cross canopy available that has no disadvantages compared to non-steerable cross canopies, even with complete passivity of the pilot.

The DIAMONDcross solution

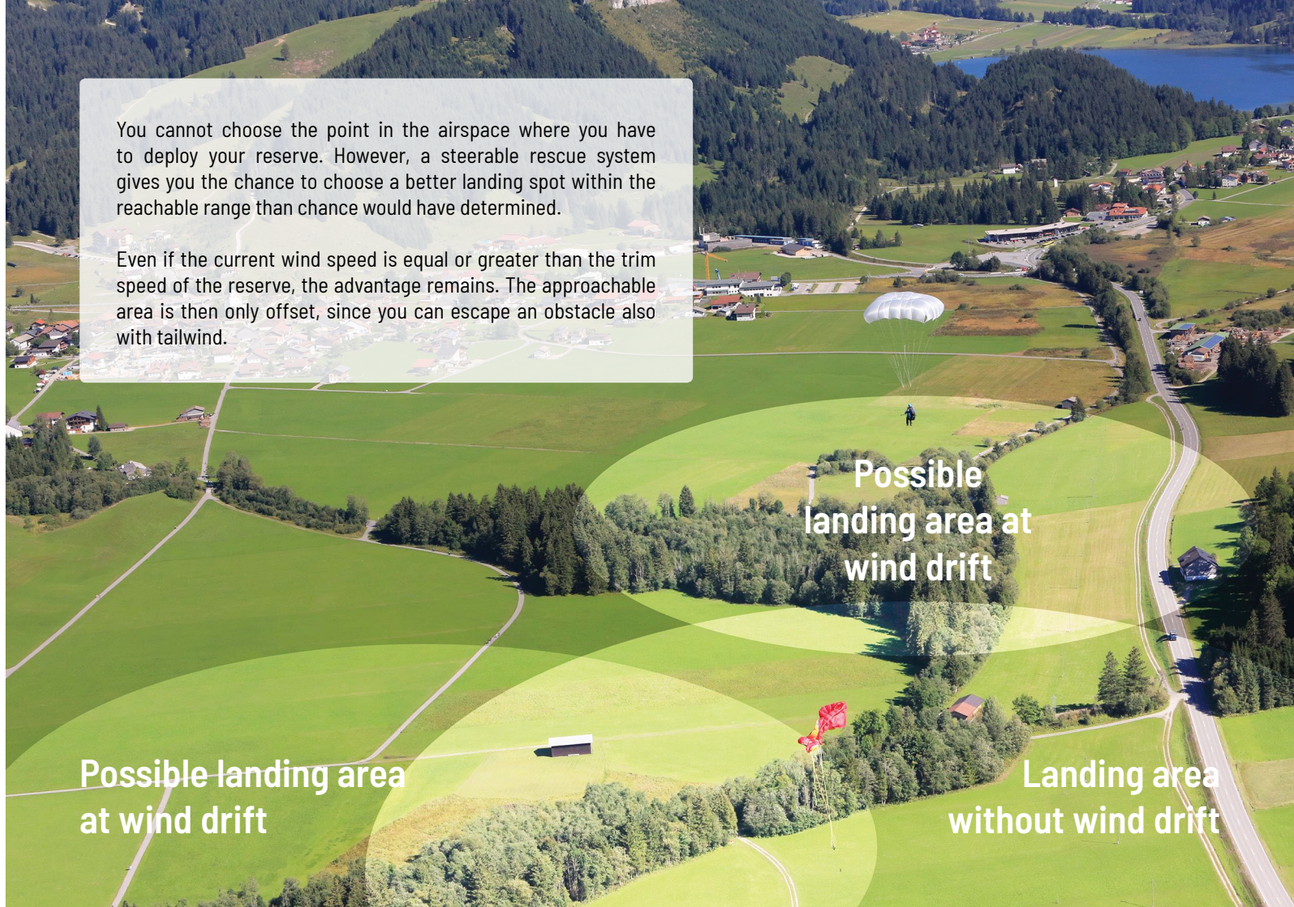
The DIAMONDcross has only moderate forward speed and enough surface area to avoid a dangerous sink rate even when stalled. The S-shaped canopy trim, as it is common for hang gliders, gives the DIAMONDcross canopy a high righting moment. The paraglider is thus quickly unloaded and dives down. This prevents the danger of a shear constellation between the reserve and the paraglider, makes it easier to pull in the main glider and even allows the unhooking of one riser with CHARLY Pinlock or conventional carabiners.
Similar to a regular cross canopy, the DIAMONDcross initially goes into a stall with vertical sinking after opening. A downplane position of the reserve is thus reliably prevented.

If you do not want to make use of the steering option or if the altitude is too low, you will sink as with a conventional cross canopy with a slight sideways drift.

Sometimes twists of the lines can occur when throwing the reserve. This is inevitable but usually unproblematic. The low friction, soft riser and line material of the DIAMONDcross makes it still possible to reliably steer the rescue parachute in the desired direction - even with multiple twists!
Twisted lines can be untwisted by kicking with the legs.

You cannot choose the point in the airspace where you have to deploy your reserve. However, a steerable rescue system gives you the chance to choose a better landing spot within the reachable range than chance would have determined.

Even if the current wind speed is equal or greater than the trim speed of the reserve, the advantage remains. The approachable area is then only offset, since you can escape an obstacle also with tailwind.



Disconnecting or not disconnecting the main glider?

When you decide to use your rescue parachute in an emergency, it is usually because your paraglider went out of control. The best way to resolve this situation is to give control to the rescue parachute and disconnect from the paraglider as quickly as possible. If you do not disconnect, it can cause you problems in several ways.

5 reasons why the paraglider should be disconnected after an emergency parachute deployment

1. According to the LTF, the maximum allowed sink rate for paraglider rescue systems is 6.8 m/s, corresponding to 24.5 km/h. However, many pilots are not aware that in the reserve parachute certification process, the sink rate is determined without the paraglider. Interactions between paraglider and rescue system can increase the sink rate substantially – for example, by increased pendulum movements or due to a resulting shear position. The risk of injury increases accordingly.

2. Although modern reserve parachutes usually reach maximum sink rates of "only" 5.5 m/s, corresponding to approx. 20 km/h, these values are often only achieved by a lateral drift that generates lift. A paraglider that is not separated or only separated on one side impedes this drift and thus substantially increases the sink rate.

3. The possibility to choose the landing spot with a steerable rescue system is a significant safety plus. If the main glider is not separated, this safety advantage is foregone.

4. It has shown that a separated paraglider usually collapses very quickly and that its salvage is easier. In the case of a tree landing, there is also a much lower risk of damage to the glider when it does not carry the full pilot weight.

5. A dangerous downplane situation of the paraglider after an emergency parachute deployment, as shown in the video linked on the right, can be resolved quickly and effectively by disconnecting the paraglider.

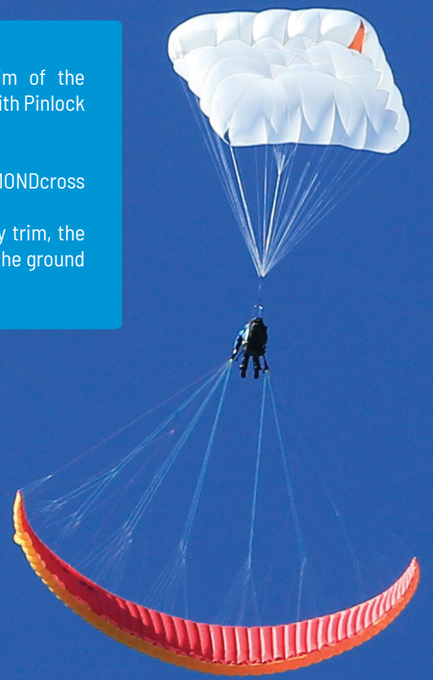
The DIAMONDcross solution

Even if the main glider is not disconnected, the S-shaped canopy trim of the DIAMONDcross allows it to easily pull it in or to unhook it at least on one side with Pinlock or even conventional carabiners,.

The rapid dive down of the main glider directly after the opening of the DIAMONDcross immediately ensures low sink rates of the reserve.
Due to the very effective pendulum damping, also resulting from its canopy trim, the DIAMONDcross is also the best choice for deployments extremely low above the ground in absolute emergency situations.

Rapid separation with the Paralock and safe landing

Example of a downplane with dangerous sink rate



Benefits of rescue systems with horizontal drift

Perfectly symmetrical parachutes sink vertically, which is not advantageous for several reasons.

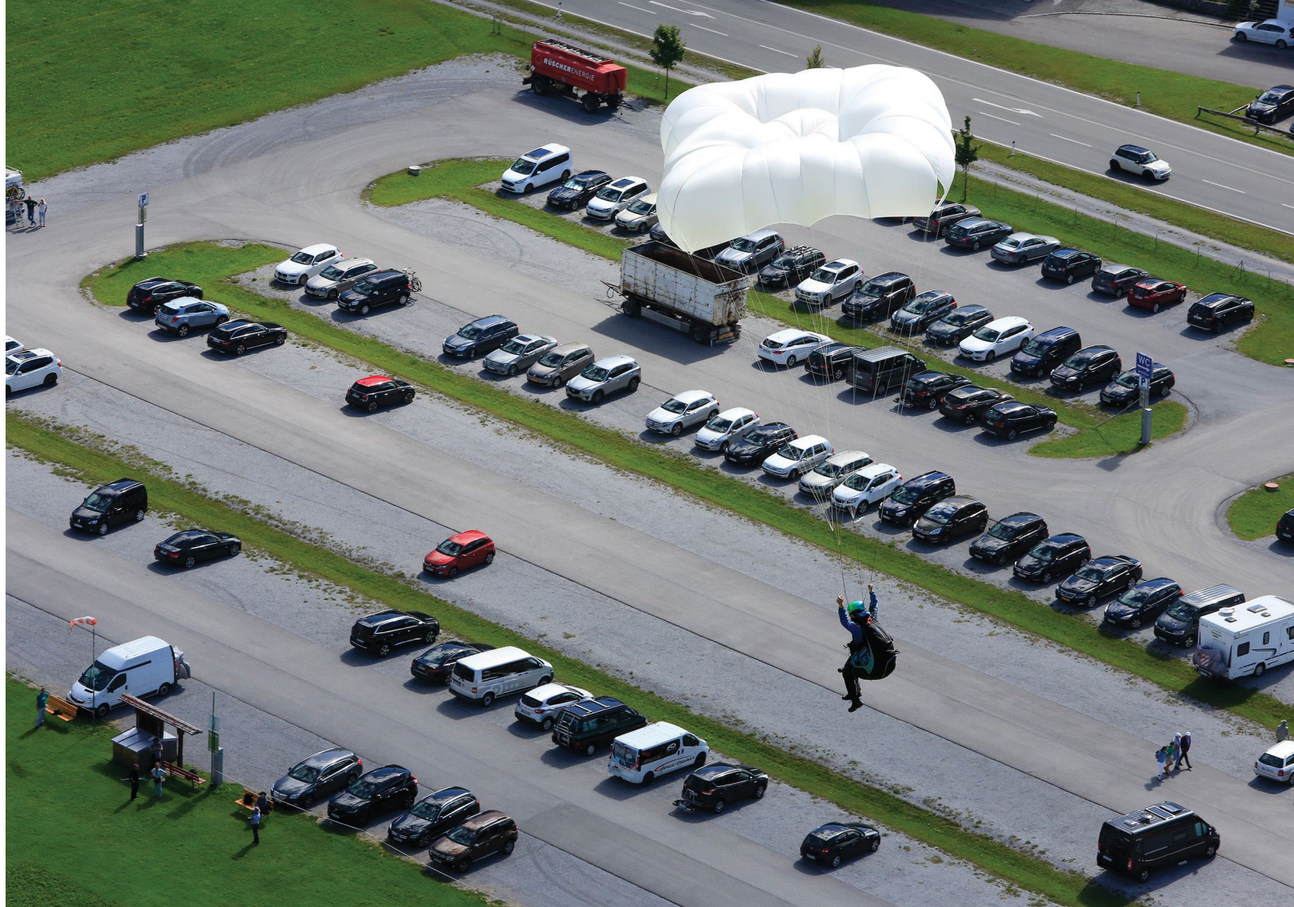
In the case of a vertical impact on a flat surface, the deceleration distance to reduce the impact velocity is the shortest, whereas in the case of an inclined impact, the forces acting on the body are lower. In addition, the human body is not equally resilient in all axes. The most sensitive axis is the one in the direction of the spine, which has to cushion an impact on the buttocks.

When a canopy is symmetrical, the air escapes over its edges sometimes more on one side, sometimes more on the other side when sinking. This causes a pendulum motion that can considerably increase the sink rate. If, on the other hand, a rescue parachute drifts, dynamic lift similar to that of an airfoil is created, with the effect that the sink rate is significantly reduced.
A patented feature of the DIAMONDcross reserve is the defined lateral drift in diagonal direction. Compared to one side of a square, the diagonal has a greater aspect ratio and thus correspondingly more lift. Conventional cross canopies have an alternating lateral drift, depending on the corner from which the air escapes under the canopy.

Rescue systems without horizontal drift also carry the risk that the uncontrollable main glider may move very close to the reserve and wrap around it due to the vertical airflow.

The DIAMONDcross solution

The diagonal configuration and S-shaped canopy trim of the DIAMONDcross with longer lines at the rear edge create a high righting moment which prevents a downplane of the canopy and ensures that the main glider is immediately unloaded. Pre-braking of the rescue parachute is therefore not necessary with the DIAMONDcross. The result is an immediate forward movement which keeps the paraglider at a distance from the reserve.
The Basic and HG versions of the DIAMONDcross also feature this trim, as the advantages of this configuration clearly outweigh the disadvantages.



Opening security and entangling of the parachute with the main glider

Situations in which the pilot and the paraglider are in SAT-like rotations carry a particularly high risk of entanglements between the reserve and the main glider during deployment. Avoiding this potential threat was one of the highest priorities in the development of the DIAMONDcross and is especially relevant for pilots flying with only one rescue system.

The DIAMONDcross solution

Long line concept The lines of the DIAMONDcross were made longer, so that the opening of the parachute happens approximately in the radius of the main glider and not in the area of its lines. In the rotational movement, the longer lines have almost no influence on the opening time, because the package separates immediately from the pilot at high speed.

Inner container design The inner container has a separate closure for the canopy, so that it is only released after the lines have been fully stretched. This results in a controlled deployment with a significantly reduced risk of an entanglement with the main glider. While the lines stretch, the still closed reserve package rotates in the same direction as the main glider. Only after the lines have been fully stretched and with a corresponding safety distance to the main glider, the canopy is released from the container. Fabric-coated rubbers, the gap-free design and the separate canopy closure also ensure that accidental deployment, such as premature opening of the container inside the harness, is excluded.

Packing method Thanks to a special but simple way of packing, the DIAMONDcross already opens at the base without delay, even before the apex has left the inner container. The higher the speed of rotation, the faster the opening in the DIAMONDcross packing method. This is achieved by the separate folding of both pre-sorted sides (instead of the usual long S-fold) and a tube inner container, in which the parachute is packed with small standing S-folds.

Line geometry The different line lengths (resulting from the steerable design) fan out the layers. This creates several gaps for an instantaneous opening of the chute base after leaving the inner container.

Technical data

DIAMONDcross

		DC100	DC125	DC160	DC220
Surface		25.2 m²	30.7 m²	41.0 m²	59.2 m²
Load max. / min.		100 / 50 kg	125 / 60 kg	160 / 80 kg	220 / 100 kg
Sink rate		4.6 m/s @ 100 kg 3.6 m/s @ 70 kg	4.5 m/s @ 125 kg 3.5 m/s @ 85 kg	4.8 m/s @ 160 kg 3.5 m/s @ 110 kg	4.6 m/s @ 220 kg 3.6 m/s @ 160 kg
Volume		3 900 ccm	4 700 ccm	5 300 ccm	7 300 ccm
Certification		EN / LTF	EN / LTF	EN / LTF	EN / LTF
Certification no.	**ST**	EP 157.2016	EP 158.2016	EP 173.2017	––
	Basic	EP 178.2017	EP 179.2017	EP 180.2017	EP 182.2017
	ST Tandem	––	––	EP 225.2018	EP 181.2017
	HG	––	EP 184.2016	EP 185.2017	EP 186.2017
Weight	**ST**	1.17 kg	1.39 kg	1.78 kg	––
	Basic	1.14 kg	1.35 kg	1.75 kg	2.46 kg
	ST Tandem	––	––	1.85 kg	2.57 kg
	HG - without swivel	––	1.43 kg	1.83 kg	2.57 kg
	HG - incl. swivel (optional)	––	1.60 kg	1.97 kg	2.71 kg

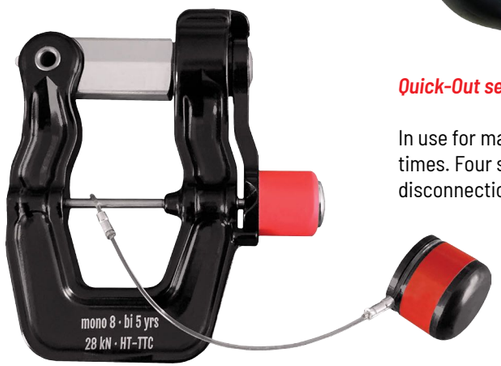
ST = steerable, Basic = non-steerable, HG = hang glider (non-steerable)

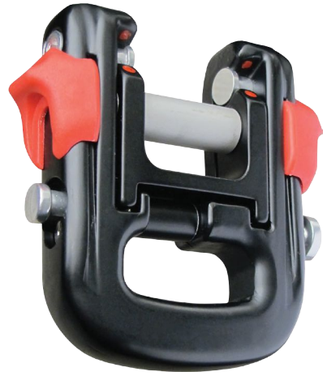
Carabiners

Paralock separation carabiner

Lightweight paragliding carabiner with easy handling and a long replacement interval, suitable for both wide and narrow straps.

The carabiner is opened by a 120° turn of the release lever against spring force, whereby the lever can only be unlocked after a button is pushed.



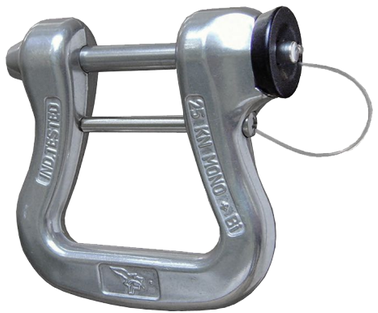


Quick-Out separation carabiner

In use for many years, proven 1 000+ times. Four security steps and rapid disconnection.

Pinlock

Fatigue-resistant paragliding carabiner, also suitable for tandem use. When the paraglider is unloaded after a reserve deployment, disconnection is possible by pulling the pin.



More info on our air sports carabiners

Accessories & spare parts

Inner containers

- **Flat version:** Optimized for best deployment from integrated harness compartments on the G-Force Trainer, sizes S, M, L, XL
- **Version for front attachment:** For best deployment from external front containers, sizes S, M, L

Riser cover

- Versions for **tandem**, **front container** or **paramotor**

Connecting links

- Lightweight connecting link made of **stainless steel** or **Dyneema**

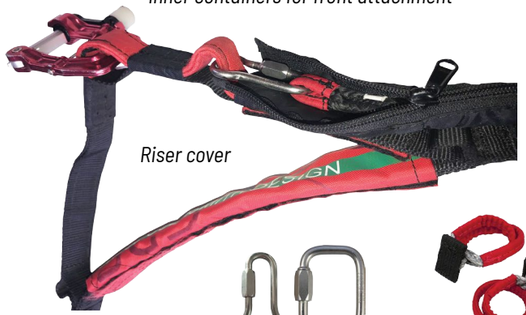
Separation links for speed systems

- Versions **Easy Release**, **Brummel hook** or **patent shackle**

More info on our separation links for speed systems

Flat inner containers

Inner containers for front attachment



Riser cover

Screw-lock links

Dyneema softlinks

All info about the DIAMONDcross at charly-produkte.de

CHARLY
BEST OF AIR

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YouTube

You can find all videos of the DIAMONDcross on our YouTube channel
youtube.com/finsterwaldercharly