

ICARO 



Energy
CROSS

MANUAL

Verification of Checks and repairs

<p>ENERGY CROSS</p> <p>Serial number:</p> <p>First check by ICARO / date:</p>	<p>.....</p> <p>Name/ Stamp</p>
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Check (C) Repair (R)	Which repair/ Check? Check valid until?	Performed by/ date

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Congratulations on buying your
ENERGY CROSS
harness and welcome the family
of ICARO - pilots!

Before you get to know your system please read the manual, there is important information inside.

This manual gives you information on the entire specific and general characteristics of the harness.

All technical data and instructions in this manual were drawn up with great care. ICARO Paragliders cannot be made responsible for any possible errors in this manual.

Should you decide to sell this harness at a later date, please pass on this manual to the new owner.

No guarantee of any kind can be made against accidents, injury, equipment failure, and/or death. It is assumed that the pilot is in possession of the necessary qualifications and provisions of any relevant laws are observed.

The use of this harness is entirely at your own risk.

Every pilot bears the responsibility of his/her own safety. The manufacturer or distributor assumes no responsibility for accidents occurring while using it.

Do not fly unless you are personally willing to assume all risks inherent in the sport of paragliding and all responsibility for any property damage, injury, or death, which may result from use of this sport.

Your harness is made with great care and state of the art, tested according European Standards EN 1651:1999¹, and Notification of the Federal Aviation Administration of Germany ².

It is strictly prohibited to fly the harness

- ***with damaged carabines, belts, buckles or protector***
- ***outside the specified weight range***
- ***in aerobatics***

¹ *Harnesses –Requirements and test methods*

² „Directives about airworthiness for hang- and paragliders (LTF NfL II 91/09)“.

All technical data and instructions in this manual were drawn up with great care. ICARO Paragliders cannot be made responsible for any possible errors in this manual.

Important information in this manual is written in ***fat cursive writing***.

Any important changes to this manual will be published in our homepage (www.icaro-paragliders.de).

Should you decide to sell this harness at a later date, please pass on this manual to the new owner.

Each alteration is dangerous and reactions are not predictable. Your harness will lose its pattern test result and guarantee.

The manufacturer or distributor assumes no responsibility for accidents occurring while using it.

Every pilot must ensure that the harness is properly checked at regular intervals.

Environmental aspects:

The materials of which a harness is made require a special waste disposal. So please send disused ICARO - harnesses back to us. We will care about a professional waste disposal without costing for you.

Please do our nature-near sport in a way which does not stress nature and environment!

Please do not walk beside the marked ways, do not leave your litter, do not make unnecessary loud noises and respect the sensitive balance in the mountains.

Especially at the launch site consideration is needed!

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ICARO paragliders, all other rights are reserved.

To get to know your ENERGY CROSS

Allowed for training	yes
Allowed /certified for aerobatics	no/ no
Allowed /certified for flying with passengers	yes/ no
Allowed /certified for flying with motor drive	no / no

Technical data	S	M	L
Specific use	Reversible harness for paragliders		
Harness specification	GH		
suspension height (cm)	40	42	45
Seat dimension (cm)	32x35	35x37,5	37x40,5
tolerable load (kg)	120		
Weight with carabines (kg)	3,5	3,6	3,7
karabiner separation distance (cm)	37-52		
Volume of container (ccm ²)	10.000		
Packing volume	Compatible for glider size XS to L		
rescue system fixing	Integrated container attached under harness		
Rescue handle	On the right side of the seat		
Check interval	24 month		

		Gewicht in kg													
		45	50	55	60	65	70	75	80	85	90	95	100		
Größe in cm	155													5'1"	Height inches
	160	S												5'3"	
	165													5'5"	
	170				S or M									5'7"	
	175						M							5'9"	
	180													5'11"	
	185							M or L						6'1"	
	190											L		6'3"	
195													6'5"		
		99	110	121	132	143	154	165	176	187	198	209	220		
		Weight Lbs													

ENERGY2, ENERGY SP und ENERGY CROSS

Through adding many new smaller innovations we could make the already much loved Energy Cross² even better “passion for detail”: The new ENERGY Cross is safer than ever, more functional and more comfy.

The **ENERGY CROSS** is a light weight reverse harness which is comfortable to carry, comfortable to fly including a high safety margin. It is a harness with an improved dynamic pressure air bag. The air bag is air-filled right from the start due to pretensioned and extremely light Nitinol rods and therefore offers a higher safety compared to conventional dynamic pressure air bags of the first generation.

In the back part a second air cushion is formed during starting which comes additionally to the required norm and serves the pilot with extra passive safety. Another highlight is the adjustable rescue compartment which can be closed by a zip. You have the possibility to reduce the size of the compartment or to enlarge it. A shifting of the rescue is therefore impossible.

The attachment options for a piece of sports equipment or a mini Vario at the shoulder straps are further thoughtful highlights for pilots that like to walk long distances.

It is the ideal harness for “Walk & Fly“. Range of application: For activities which require next to a comfy seat whilst flying, a close to the body feeling and a stable balance of the rucksack. Mountain tours "walk & fly", long distance carrying (for example from the parking to the cable, or from the cable car to the starting ground etc.)

Further development **ENERGY CROSS** features are

- New airing system with more airing canals within the airbag for more safety.
- Standard with adjustable seat board height adjustment features
- New hang loop „more stability in flight“ warranted
- Camelbag H²O fixation point with drinking system exit – important when doing Walk & Fly
- Larger rucksack volume
- Design-upgrading

The patented APS 5-carrying system is hidden behind a comfy cushioned pad over the back and hip sections and can be easily adjusted to the right back length with help from a size-identifier-system.

The point of suspension has been chosen in a way that the pilot is given a high feel for the glider without giving a wobbly impression. Active flying is being supported through the new body-control-system and turbulences inside the canopy can be recognized better and be avoided right in the beginning.

It offers thanks to the specially developed leg strap guidance and the fold-away sitting board a maximum of free moving space when starting, ground handling and landing.

Speed system

All necessary deflection pulleys to install the speed system are mounted. The rope guide was chosen to provide easy and comfortable use of the speed system also for longer periods of time.

Put the ropes which are attached at the foot bar through the rings at the front right and left of the harness from the outside and then through the eyelets on the side.

Afterwards put the ropes which are now running inside the harness through the pulley which can be found at the left and right of the sitting board.

The ropes which have been put through the eyelets and the pulley need to be bypassed on the outside along the harness bands and fastened with the brummel hook.

Adjust the length of the rope in this way that both legs are straightened completely when flying maximum speed (both pulley of the risers are laying on top of each other).

Please pay attention that the glider will not be pre-accelerated, while the accelerator is loosened, when the acceleration ropes are set too short.

At the start we advice to fix the accelerator with the Velcro which is attached at the front of the sitting board, in order to avoid tripping while pulling up the glider or when starting up.

The description refers to the rope characteristics of an ICARO harness. When using a different harness the application can be different.

Before starting the brummel hook (foot accelerator-glider-riser) are stuck together. When flying normal all risers have the same length. When using the accelerator system the risers A, B and C are shortened by a constructive exactly defined length and therefore the angle of attack of the canopy is smaller. The length of the D-riser however is not changed. This causes a reduction of the angle of attack of the whole glider and results to an increase of speed.

Adjustment of ENERGY CROSS

The harness can be adjusted in many ways to the individual needs and likings of each pilot. We advise each pilot to take time to get acquainted to the harness. This will reward the pilot with an excellent sitting comfort. To carry out the adjustments we advise to hang the harness in a simulator.

Conduct the adjustments with the rescue system installed.

Seat Position Adjustment

This first adjustment changes the angle between back and thighs. This angle can vary between 70 and 110 degrees. It can be adjusted with the side buckles. A sitting position allows a lower mass inertia and prevents twisting.

A horizontal position has a lower aerodynamic resistance and enables a better gliding in accelerated speed. The side buckles of the harness also allow easy adjustment during flight.

Adjustment of shoulder straps

Adjust the shoulder belts while standing. They are to be tightened so you can just stand straight.

Fix the buckles for adjustment into the flat. If you don't, the belt isn't fixed.

Adjustment of Leg straps

Pull the leg belts tight before starting, but make sure they do not cut in or squeeze. Due to a special design the leg belts will not hinder your running at the start.

Because they are tied tight, the front of the seat is lifted up and helps you getting into the harness. By slipping back in the gear, the leg belts loosen a bit after start.

Adjustment of chest straps

The adjustment of the harness chest strap controls the distance between karabiners and affects the handling and stability of the glider.

Excessive tightening the chest strap increases stability but also the risk of twists following glider collapse, and it also increases the frequency of getting collapses due to poor feedback from the glider.

The risk of twisting is also strongly affected by the seating position of pilot. Flying in a laid back (reclined) position makes it much more difficult to react in time to prevent riser twisting.

With the chest strap in a more closed position the glider also has more tendency to maintain a stable spiral, lengthening of the chest strap gives more feedback from the glider but decreases stability.

ICARO paragliders recommends following settings:

Take off weight	< 80kg	80 kg -100 kg	> 100kg
Horizontal distance of the main karabiners	38 cm – 42 cm	42 cm – 46 cm	46 cm – 50 cm

Each setting the harness must be done with mounted protector, rescue system and be symmetrical on both sides.

The harness is provided with a big rear packbag. All flight accessories (fruit, pullover, cookies...) not needed during flight can be placed in this rear packbag. This packbag can be filled most easily before you turn the harness preparing to fly.

Not needed accessory must be stowed only in this packbag, otherwise the ventilation of the air bag is disturbed and it cannot fill perfectly.

Have you stowed the things, close the zipper of the packbag, turn the harness and close the zipper of the airbag. So it can fill in flight and is ready for use.

Fitting the rescue system

To install the rescue system a container is mounted under the seat. The opening is installed as standard on the right hand side. If desired, it can be positioned on the left hand side. The container of the harness contains a rescue handle. Only this handle has to be fixed with its loop to the inner container of your rescue system.

If in your inner container there is no loop, get in contact with the producer of your rescue system.

Most harnesses have a handle for the harness containers. This handle must be connected to the inner container. The inner container of ICARO rescue systems has two loops, in which the handle of the harness can be attached (center, side).

Handles for front and back containers are generally suspended in the central loop, container on side or under the seat, the side strap used.

If there is no handle of the harness or it does not fit with your inner container, please ask the dealer of your harness or your paragliding school.

Attachment of the connection belt with the harness

For connecting the two belts use a fixable 24 KN- snap hook with a diameter of 8 mm. It is very important that the snap hook cannot twist to prevent traverse stress of the snap hook.

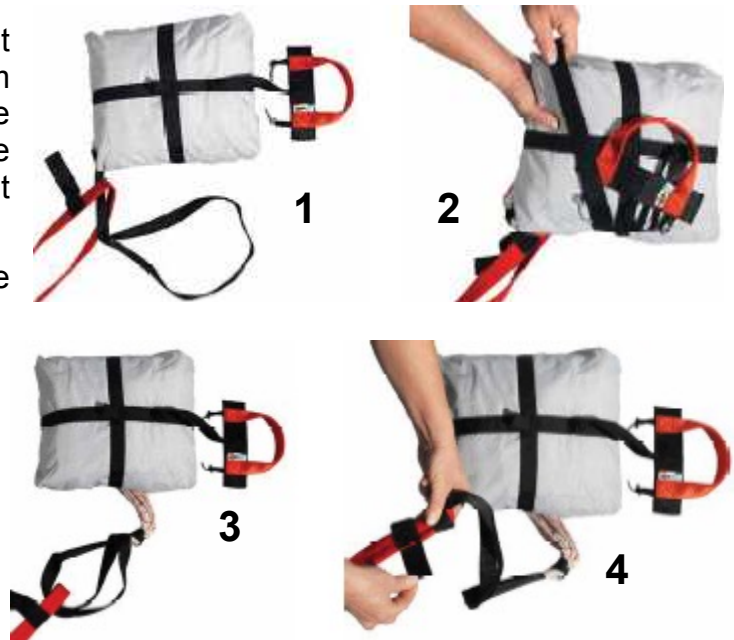
Therefore use cable fixer, adhesive tape or strong rubber bands and pull it **above and below the snap hook** around the belts.



Another fixing method is to put the belt of the rescue system through the connection belt of the harness and than the rescue system trough the harness belt as shown in the photo.

It is just as very important that the knot is very tight fastened.

Therefore use cable fixer, adhesive tape or strong rubber bands and pull it **above and below the knot** around the belts.



Please pay attention to the symmetry of both lines. Neither side of the loop must be longer than the other.

Closing the Container

Now put the rescue system in the container under the seat.

First insert the delivered rubber bands in the eyelets of flap (flap with smaller eyelets).

The rescue connection handle must be threaded through the loops so that the connection line can be tightened without difficulty.



The packing cords are threaded through the eyelets of the lower flap.



Then the packing cords are threaded through the eyelets of the upper flap.



Then pull the lines through the last remaining flap (with transparent window) and fix the splint with the now visible rubber bands.



Remove the cords used to help pack the rescue system!

In order to avoid unwanted release of the rescue system, the closing splint must be held with a special thread (50 N) which is made with certified material.



A higher breaking force could otherwise endanger the release of the rescue system! After installing the first rescue system it is essential to conduct test activation (in flight position, sitting in the harness).

Compatibility check

A control of every new combination of rescue system and harness/outer container has to be carried out by either the producer of the harness or the rescue system or an authorized person (dealer or flight instructor).

The activation of the rescue system in flight position has to be correct and in conformity to the construction guidelines.

The check has to be recorded in the documentation of the rescue system. The throwing movement should be practiced every time the rescue system is repacked.

IMPORTANT POINTS TO LOOK OUT FOR:

⇒ Check (steady)

- connection of the rescue system to your harness
- connection of the harness and deployment handle
- the closing splint must be held with a special thread
- aluminum karabiners; aluminum might get micro cracks from impacts during use

⇒ line from the fixing loops is removed (after each packing)

⇒ Check compatibility of rescue system and harness

⇒ Before each start with your glider you have to check the container is closed!!!

Correct handling of the rescue system

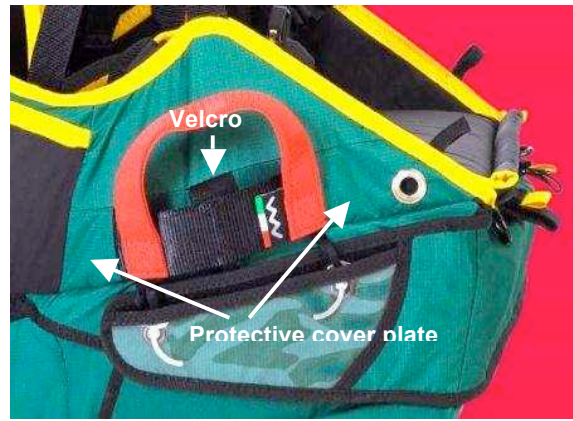
In nearly all commercial harnesses with integrated rescue system the handle of the rescue system is mounted on the right hand side (optionally it can be mounted on the left).

To prevent unintentional operating of the rescue system most harness models with a handle mounted on the side (Tube- , side- , back containers) offer additional safeguards.

Depending on the model ICARO harnesses one or two cover plates attached to the rescue handle are used to be stuck into two flaps and are secured with an additional Velcro.

This ensures that lines cannot interlock with the handle pad and the rescue system opens unintentionally (e.g. during ground handling).

This fallback system for rescue handles is very effective and therefore used in many other harnesses.



ENERGY 2

ENERGY CROSS, ENERGY SP

The used material for handle pads and the Velcro provides a guarantee for functionality and safety against unintentional loosening. The new material is stiff and therefore

ICARO paragliders recommends to bend the handle pad a couple of times and open and close the Velcro before each installation. Thus the web of the handle becomes softer and the adhesion of the Velcro decreases.

The release of the rescue system represents an essential factor to reduce the required release force. When the handle is pulled upwards, the resistance caused by the protective cover is much higher when releasing it horizontally or diagonally upwards.



Therefore we recommend to train (before repacking the rescue system, during g-force trainer) these methods.

Another problem can arise when the handle is released with the other hand. After evaluation of different air accidents, however, it was found that such a situation only happens with multiple adverse conditions (for example wrong recovery of a Full stall, partly fallen into the cap, the throwing hand covered in lines and additionally spiral dive) .



Also in this case it is essential not to try to pull the parachute handle vertically but as far as possible horizontally or diagonally upwards.

Finally, we would like to note that our physics set limits although they can be shifted to a certain limit however cannot be exceeded and therefore compromises are inevitable.

Flying with the ENERGY CROSS

It is important to perform a pre flight check before taking off. Please give the following points your special attention.

Check your harness and make sure that all connections to pilot are correctly closed.

Check that all karabiners are closed and can not be opened accidentally in flight and that the risers are not twisted.

The harness is suitable for towing. For this you either need a towing attachment or two screw-in trapeze shackles.

The towing attachment is available from specialized dealers and is mounted to the main karabiner with the straps. The trapeze shackles are available from flight schools and should be placed at the chest belt between the shoulder belt and main suspension. The towing link is attached to this.

Care and repair Instructions

Care Instructions

To maintain your harness in good condition, please ensure that the harness does not get dragged along the ground, the karabiner does not get hit against rocks and avoid over exposure to sunlight, heat or humidity.

If you wish to clean your harness it is best to use warm water and a soft sponge.

Store your harness in a dry and dark place, ideally between 5° and 30° Celsius. Do not store it near chemicals or petrol.

If you will not fly for longer period, take it out of its pack.

Avoid storing your harness for days at a time in a hot car.

If the harness has become wet, lay it out so that air can get to all areas of the fabric, also your second chance.

It may take several days for your harness and your rescue system to dry out completely especially the lines of the rescue system, which take longer than the fabric. Do not fold and store your rescue system prematurely if it not completely dry. Mildew may damage your harness and your rescue system.

Repairs

The seal of approval can only be preserved if original parts are used. If you discover any damaged parts to the harness which might impede deployment, please end it back to the manufacturer to be repaired.

Repairs can only be carried out by the manufacturer or from the manufacturer authorized persons.

The aluminum karabiners should be changed every two years at the latest as the aluminum might get micro cracks from impacts during use.

Inspection

After 24 months, it is important to have your harness inspected by a trained ICARO technician.

Without regular certified inspections, your harness will loose its certification and guarantee.

Only an authorized technician who has been trained by ICARO paragliders is authorized to sign and date the harness certification label and sign the manual.

Terms of guarantee

ICARO paragliders guarantees 24 month for the proper processing, an operation within the allowable limits of proper operation and the fulfillment of the eligibility criteria of harness equipment at the time of first delivery by ICARO paragliders.

Guarantee is only valid for ICARO products with LTF/ EN certification.

What is covered by the guarantee?

Provided that ICARO paragliders accept the fault the guarantee contains all necessary spare parts related to the replacement or repair of defective parts and working time.

What are the conditions of the guarantee?

- ICARO paragliders needs to be informed immediately after the discovery of a defect and the defective product must be sent to us for testing.
- The harness was used in normal circumstances and maintained according to the instructions. This includes in particular the careful drying, cleaning and storage.
- The the harness were used only within the applicable guidelines and all rules have been complied with all times.
- All flights must be accounted for within the flight book.
- There were only original spare parts used and checks, exchange and / or repairs were conducted by an authorized dealer or by ICARO paragliders company / person and properly documented.
- A fully and correctly completed guarantee card must be sent at least 6 weeks after buying the glider to ICARO paragliders commercial. Alternatively can this be sent via the appropriate online form on www.icaro-paragliders.com.

What is excluded from guarantee?

- Harnesses
 - that are used for training purposes, Acro or other official competitions,
 - which were involved in an accident,
 - which have been changed by yourself,
 - that were not purchased from an authorized dealer / flight school,
 - where the required inspection intervals were not met and the verification of the harness was not conducted by a ICARO paragliders authorized operation / person
- Damage
 - which has occurred due to improper treatment (i.e. storage in humidity, heat or direct sunlight)
 - caused by solvents, salt water, insects, sun, sand, humidity or “debag-jumps”.
 - caused by force majeure.
 - caused by the paramotor (Oil, fuel, damage in cause of the prop)
- Parts that need to be replaced due to normal wear and tear,
- Discoloration of the cloth material used,

In case of a concluded claim the period of guarantee carries on. The period of guarantee and the connected claim are not prolonged and are only valid until the original date of expiry. The freight costs (transport to and from) are not paid by ICARO paragliders.

Annex

Please fill in the guarantee card which you find on our homepage www.icaro-paragliders.com and send it to us.

Check sheet for harnesses			
Client (Name, Address):			
Type / size / year of construction :		Serial number:	
Certification number:		Date of last inspection:	
		Memos	yes no
Seat strap system	Visible damages?		
	Areas of abrasion?		
Seat board	Visible damages?		
	Positioning of the straps ok?		
Straps	Visible damages?		
	Course of the straps?		
	Seams ok?		
Buckles and carabines	Visible damages?		
	Condition (closing properties, operation) ok?		
	main carabine (condition, age)		
	Operativeness ok?		
Protectors Airbag -/ Foamed material	Visible damages?		
	Seams ok?		
	Valve ok?		
	Tightness airbag/ foam protector sheeting?		
	Conditions of any reinforcements ok?		
Speed bar	Visible damages?		
	Fixing rubber ok??		
	Return pulleys ok?		
	Lines ok?		
Rescue system	Visible damages?		
	Identification plate ok?		
	V-lines		
	Handle fitted and connected? Container properly closed?		
Backpack (reversible harnesses)	Visible damages?		
	Zip ok?		
	Buckles ok?		
	Seams ok?		
Compatibility check effected?		Additional repairs carried out? Which?	
Type label affixed?			
Inspection stamp affixed?			
Overall result		Next inspection:	
As new			
Very good		Next inspection when using the harness commercial:	
Used			
Much used		Date, name and signature of the checker	
certification only for one year			
not airworthy			

Dispatch protocol / Delivery content

Handle

Seat Board

Carbines

Manual

.....

Date

.....

Signature