



photo Krzysztof Romicki

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Congratulations!

We are pleased to welcome you among the growing number of DUDEK PARAGLIDERS pilots. You've become a proud owner of a sport paraglider, designed according to recent trends among paramotor canopies.

Extensive development, application of the modern production methods and thorough testing resulted in a friendly behaving paraglider, offering the pilot a lot of fun combined with great performance.

We wish you many enjoyable and safe flying hours.

Please read this manual carefully and note following details:

- The purpose of this manual is to offer guidelines to the pilot using the paraglider. By no means it is intended to be used as a training manual for this or any other paraglider.
- You may only fly a paraglider when qualified to do so or when undergoing training at an accredited school.
- Pilots are personally responsible for their own safety and their paraglider's airworthiness.
- The use of this paraglider is solely at the user's own risk! Neither the manufacturer nor dealer do accept any liabilities involved.

- This paraglider on delivery meets all the requirements of the EN 926-1 and 926-2 regulations or has an airworthiness certificate issued by the manufacturer. Any alterations to the paraglider will render its certification invalid.
- Other documents concerning this paraglider can be found on attached pendrive or on our website www.dudek.eu.

Note: Dudek Paragliders warns that due to the constant process of development the actual paraglider may differ slightly from the one described in the manual. However, those differences cannot affect the basic design parameters: technical data, flight characteristics or strength. In case of any doubts contact us please.

For whom the Boson?

Boson is a paraglider designed for experienced pilots, flying actively and often, who are well familiar with reflex wings behaviour and have fully mastered flying them. The recommended minimum is 300 hours paramotor time and at least 50 hours of annual flight time.

It was designed with competing and record hunting in mind. It features considerable speed range, precise handling, and great efficiency.

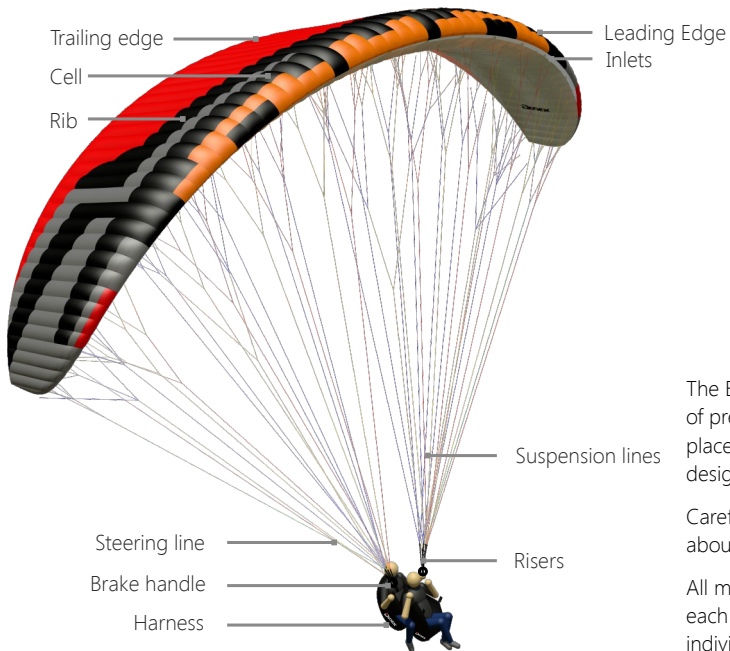
Design

Boson was based on our proven and acclaimed Hadron Cabrio. Both the 3D body and planform remain similar, still many design solutions are new, from the length of lines to design of the risers, modified accordingly to experiences of the Hadron Cabrio pilots. Among others, the risers have been equipped with a speed system. Suspension lines have been shortened, positively influencing agility and launch behaviour.

When rising, the canopy moves smoothly and shows no tendency to overrun the pilot. The quality of the launch is ensured among else by stiffening the leading edge with elastic rods (FET - Flexi Edge Technology), which also guard it against collapses at high speeds.

The design incorporates other effective ways of load distribution too, related to the newest sewing techniques.

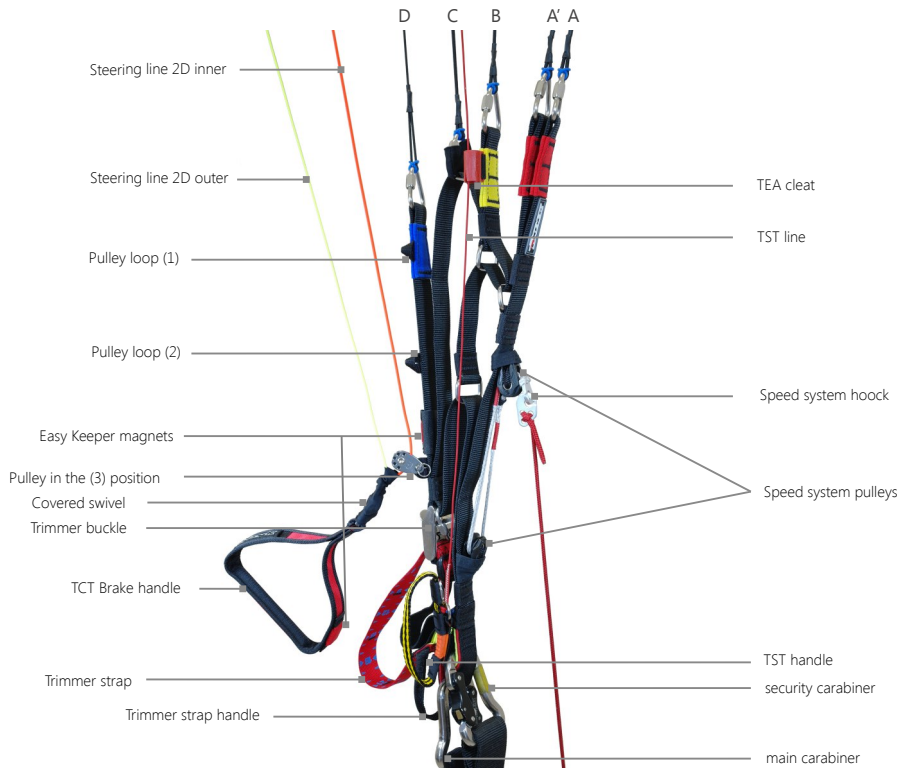
In comparison to Hadron Cabrio, Boson needs less power, easily noticeable in less sink with switched-off engine. Boson does require some attention from the pilot in turbulence, nevertheless remains safe and stable. For the steering comfort, it's important to precisely adjust the steering lines' length, accordingly to suspension height of the paramotor or a trike - every inch counts here! Steering system itself consist of our renowned and efficient 2D steering with TCT handles, plus additional TST's for the accelerated flight. As standard you can choose between three levels of the steering pulleys and docking magnets. Due to these improvements, operation of the steering system is intuitive.



The Boson is produced in new technology, utilizing capabilities of precise laser cutter. All stages of the production process take place as our Polish plant under close supervision of the designer himself, thus ensuring highest European quality.

Careful selection of modern fabrics and design solutions brings about great strength and durability of the canopy.

All materials used come from marked production batches, and each production step can be verified down to identification of individual worker and controller.



For the Boson we have chosen four-way risers equipped with:



ELR (Easy Launch Riser) system. It is a specially marked A riser (with red cover).

Speed System affecting A, B and C risers when engaged, featuring ball-bear pulleys and a dedicated line.



Trimmers of red band marked with appropriate scale and locking magnet on its end.

Different levels of the pulleys, to be used depending on the hangpoint level.



TEA (Torque Effect Adjuster) - eliminates the engine torque effect, shifting paraglider contrary to propeller turn direction. The TEA system is on when TEA line is placed on proper side.



TST - (Tip Steering Toggle) - dodatkowe mini-sterówki do sterowania stabilizatorami, dołączone do linki TST.

A - red (used for launching),

A' - red (used for big ears),

B - yellow (used for B-stall),

C - neoprene black,

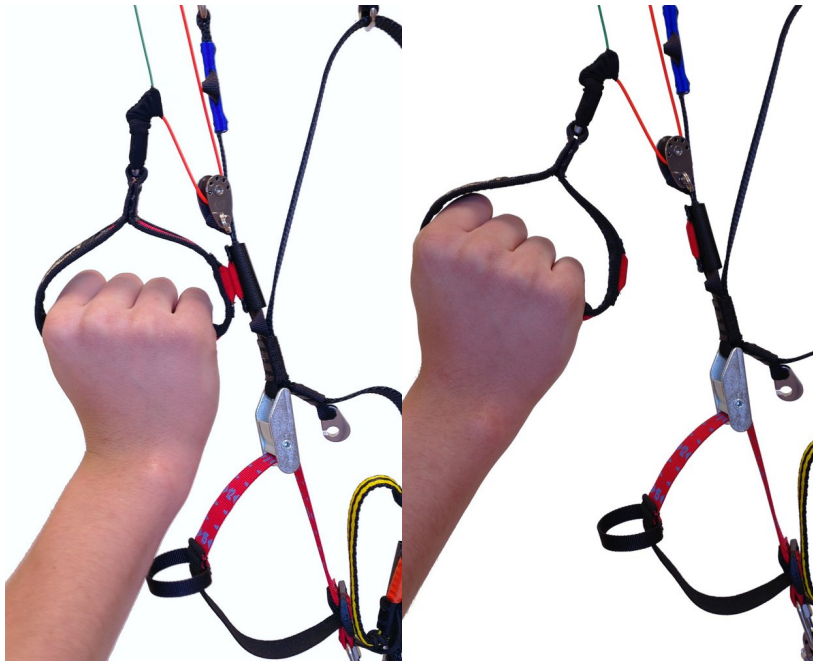
D - blue (needed to keep the glider down in strong wind – aborted launch).

For quick and easy recognition in emergency, some of the risers are distinguished with coloured covers as follows:

EK
Easy Keeper

Easy Keeper is our indigenous way to hold the brake handles at the risers by using strong neodymium magnets. It keeps the handles firmly at the risers, while both attaching and releasing goes smoothly and easily.

The system allows for easy placing the brake handles on risers during flight, when they are not used, thus minimalizing the danger of getting into running propeller.



TCT

Triple Comfort Toggles

Addressing different needs of our clients we have created a TCT system - Triple Comfort Toggle, making it possible to have your brake handles in rigid, half-rigid or soft configuration without need to purchase additional handles.


 half-rigid
plastic insert


rigid insert

The soft handle is obtained when no insert is used.



Operation

Correct matching of the canopy and the paramotor belongs to the pilot.

Dudek Paragliders cannot take responsibility for all possible combinations, but if you contact us we are always ready to help.

Weight range

Each size of the canopy is certified for specific weight range, meaning total take-off weight including the pilot, harness, paramotor, equipment and the canopy itself.

Exceeding maximum take-off weight described in technical data of the paraglider ("Pilot's weight incl. equipment") increases risk of an accident in case of pilot's error. The smaller canopy area as compared to take-off weight, the greater the risk.

Paragliders considerably change their character due to increased load and each experienced pilot should perfectly understand that.

The biggest danger induced by overloading the canopy is its hyperreactivity.

- **Caution:** Check your real take-off weight! Some pilots calculate their take-off weight by just summing up catalogue numbers, e.g.: paramotor 29 kg + canopy 6 kg + pilot 87 kg = ca. 120 kg. In fact your actual take-off weight can be umpteen kilograms bigger. Most often we forget the clothing, electronics, backpacks, sometimes even such basic things like fuel or rescue chute weight are omitted!

Adjustment of the steering handles, the pulley and the speed system

- **Caution:** Before first use of the paraglider check if the steering lines and their pulleys are fixed for the upper or lower paramotor hangpoints and adjust them to your needs when necessary.

As much as three positions for the steering line pulley are available. Factory setting is in the lowest loop.

On the main brake line there are points marked for the brake handle at the lower position of the pulley. Depending on the pulley placement you have to adjust the steering lines' length accordingly.

Changing the pulley position from the lowest (factory) to the

medium or the highest may be associated with the need to extend the length of the steering lines by the distance between individual pulley positions.

The steering lines' length should be adjusted so that in max speed mode (released trimmers and fully engaged speed system) the steering lines are not affecting the trailing edge.

It's also possible to readjust the Easy Keeper magnets position on the risers. At the highest pulley setting the magnet is also at its highest position, while at lower setting the magnets are also placed lower, as shown on the picture.

Steering lines progression - that is the difference in length between the central line led through the pulley and the outer (yellow) line - is set at the factory and basically should not be adjusted. As an exception the progression can be altered to suit individual preferences, but no more than +/- 3cm and keeping to the rules described above.

Before you take your Boson in the air, we strongly advise to try out everything first. Hang up the entire PPG unit with ropes (in case of a trike it is enough to clip the risers in), sit in and have someone pull up the risers. You must make sure that in flight you will always be able to reach the brake handles, even if the airflow blows them away.

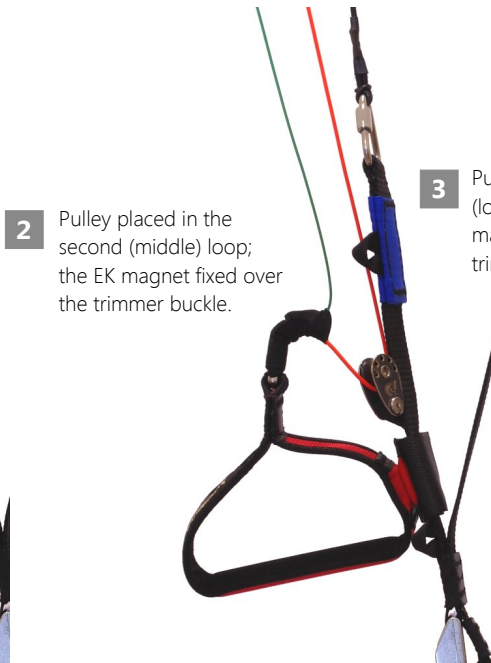
Being suspended in this way you have a perfect opportunity to adjust the speed system lines and the launch assist system too (if present).

The speedbar when not in use must not pull the lines nor risers. Neither should it be too loose, for it could then get into rotating propeller.

The launch assist system should engage the A risers, shortening them when the canopy remains behind the pilot. During inflation its effect should gradually diminish and finally disappear completely as the canopy arrives overhead. If you think the paraglider is rising up too rapidly, lines or straps of assist system should be lengthened.

An additional way to check the whole configuration out is to visit take-off site in steady winds. Inflate the canopy and take it up over your head. When it stabilises, check that the brakes are loose and are not pulling the trailing edge. There should be a spare inch or so before they activate.

Remember that it is always safer to set the margin of play too big than too small. And, most important, the setting must always be symmetrical.





Additionally mounted straps shorten A risers during inflation (left photo). When the canopy is ready at 12 hrs position, A risers go back to their original length (assist system ceases to work - right photo)

First flights

In order to get familiar with your wing we recommend at first flying with the trimmers in slow positions (trims closed or slightly opened 2-3 cm), since in this configuration the Boson behaves as a classic wing.

Once you feel confident with your wing, you can start experimenting with faster trim settings and speed system. Use all additional speed and vigor of the Boson.

- **Caution:** Before each launch it is necessary to have a thorough check of the paraglider, harness and power unit.

Classic (forward) launch

Even when it seems that there is no wind at all, it is rarely so. Therefore always be careful in determining the conditions, since in PPG flying it is most important that the launch and initial climb are performed with a head wind (the danger of losing your airspeed while steep crossing of the wind gradient is greatly reduced then). Special attention must be paid to trees, power lines and other obstacles, including the possibility of emerging rotors.

Preparing the canopy

Lay out the paraglider downwind of the power unit, with all suspension lines taut and pointing toward center of the power unit.

The risers are to be laid on the ground. For the launch closed trimmer position is recommended. In strong conditions faster settings can be advised. Make sure that you warm up the engine while standing windward of the wing. Stop the engine before clipping in the risers. Before the launch run the pre-launch checklist.

See if:

- the helmet is on and locked,
- the risers are clipped in the carabiners,
- the trimmers are properly set,
- nothing will get in propeller's way,
- speed system is running without problems,
- steering lines and handles are free and not twisted,
- the engine delivers full power,
- the take off area is clear of obstacles and free to use.

Applying steady and equal pressure on both A risers move forward. The wing practically does not overshoot, so the front collapses that

- ! **Caution:** Ill-adjusted steering lines can be a reason for wrong assessment of the canopy state, and/or can cause dangerous deflations on high speeds when too short.

Other systems

This paraglider has no other systems which can be adjusted, exchanged or removed.

otherwise happen quite often during launches are rarely seen with Boson. Instead it kind of waits for you to catch up.

From now on you should steer the paraglider facing forward, without looking back over your shoulders. When the canopy lies low behind you and you will try to turn, some lines can get in the propeller. On the other hand, possible fall on your back and damaging the propeller is dangerous (and costly!) so it should be avoided at any price, even that of some damaged lines!

During take-off, when you feel that the strain on both risers to be equal, open up full power and lean back to counter the engine thrust, so that it can push you forward rather than towards the ground. The best option is not to use the brakes, allowing the paraglider to rise as it was laid out. If it starts to swerve from its course, just pull the opposite riser and run under the centre of the wing while observing starting direction. If the wind lulls, give a stronger pull on the risers.

If the paraglider drops to one side or back too far to rise again, kill the engine, interrupt launch and assess the conditions once again.

As the wing rises, the forces grow lighter and it should stabilise above your head without overshooting. This is the best moment to check if it is inflated in full and the lines are not tangled, but do so neither stopping nor looking back over your shoulder. Once you feel

the forces on the risers decrease, run faster and let go of the risers. See if there is already any opposition on the brakes and, if necessary, use them to correct direction or to increase lift at take-off.

Remember:

- If the cage of your power unit is not stiff enough, the risers strained during launch can deform it to the extent of colliding with the propeller. Before giving it full power, see that the cage did not catch any lines.
- Any brake operation (or steering inputs in general) should be smooth and gentle.
- Do not try to take off until you have your wing overhead. Hitting the gas pedal before that can cause dangerous oscillations.
- Do not sit in the harness until you are sure you are flying!
- The faster the trim setting is, the more brake input is required to take off.
- The lower the hangpoints of your power unit are, the easier is the launch.

Reverse launch in strong wind

Reverse launch can be executed only as a foot launch or with ultralight single-seated trike. You can do it holding both A risers and

one brake in one hand, with throttle and the second brake in the other hand. With a decent wind it is by far the best way. In weaker wind it is better to prepare a classic launch, as running backwards with a paramotor on your back is not the easiest thing to do. It is reasonable not to pull the wing up until you are really determined to launch, especially when it's already clipped in.

Lay down the rolled paraglider with its trailing edge against the wind. Unfold the wing enough to find the risers and check that no lines are looped over the leading edge. Stretch the risers against the wind, separating right and left one.

We suggest that you lay the risers in the same way as you will be turning during reverse launch, and place one riser over the other, with rear risers upmost. It should be done this way because once you clip in, the cage of your power unit will make turning on your own practically impossible (with the canopy lying still).

Now run the pre-launch checklist.

After warming up the engine put the power unit on, turn to face the wing, go to the risers and clip them in the appropriate carabiners.

Pulling on the front and rear risers open the cells. It is a good idea to pull up the wing briefly in order to check that the lines are not

tangled. Holding the risers, brakes and throttle as described above, pull the front risers and inflate the canopy. The Boson comes up easily and sometimes may require a dab on the brakes to stop it over your head.

Once you have it overhead, turn around, open the throttle and take off. As with the classic launch, in this case too you have to find such combination of trimmers, brakes and throttle settings that will give you the best speed and rate of climb.

Remember:

- You are launching with your hands crossed. You have to really master this technique before trying it with a running engine on your back.
- Any brake operation (or steering inputs in general) should be smooth and gentle.
- Do not try to take off until you have your wing overhead. Hitting the gas pedal before that can cause dangerous oscillations.
- Do not sit in the harness until you are sure you are flying!
- The faster the trim setting is, the more brake input is required to take off.

! Caution: When clipping in the crossed risers, you can find proper connection of the speed system particularly hard.

Be careful not to confuse the risers!

Forward launch with trike

Basic difference of the trike launch is that you are using your power unit to get the wing overhead, and instead of pushing the A risers usually a launch assist system is used.

After all preparations and checks, with the risers properly clipped in you can start the engine. If a launch assist system is used, there is just a steering handle in one hand, with the other hand grabbing the other brake handle and throttle. Depending on power output of your motor initially open the throttle only enough to fill up the canopy and get it above the propeller downwash.

When the trailing edge gets some three meters above ground and both risers are equally loaded, open the throttle fully. Preferably you should not be using the brakes during launch at all and let the canopy rise as it was laid out. If you see it getting off course, give a delicate counter brake and steer your trike under canopy root (center), while maintaining general take-off direction steady as possible. If the wing drops too far to the side or behind you to get it up again, switch off the engine, abort launch and re-evaluate

conditions.

As the canopy rises, its resistance grows lighter and it should stabilise above your head without overshooting. Too hasty corrections of launch direction can result in sidewise oscillations – still, if they are not too deep, you can keep full power in order to get off the ground as soon as possible.

After lift-off canopy will stabilize itself overhead and throttle can be eased off a bit to get desired climb speed.

Climbing

Once you took off safely, continue heading against the wind, using brakes to correct rate of climb. Do not try to climb too steeply - attempts to increase climb rate by pulling the brakes will have an adverse effect, as due to additional drag the actual rate of climb will worsen and with the throttle fully opened even a stall can occur.

In powered flight the Boson behaves more like an aeroplane than a paraglider, and it is good idea to regard it as such. If there are no obstacles present, it is by far safer (and more impressive for the spectators) to level for a while after take-off and gain some speed before converting it to height with a brief pull on the brakes.

Another reason not to try climbing too steeply is the risk connected with engine failure at low altitude. Even as the Boson in a steep climb does not stay behind as much as conventional paragliders do, the low speed is more likely to cause a stall. Besides, you should always be able to land safely in case of engine malfunction, so it's better not to take unnecessary chances and always fly with a safe margin of speed.

Depending on the power unit geometry, it is possible that after take-off you will notice a propeller torque (turning moment). It will try to turn you around, so counteract with a brake.

The risers of the Boson feature our TEA system (see next page). Pulling the knot down through the tube are the way to counter the torque effect when your paramotor is not equipped with cross-bracing. For the TEA system to work properly you have to make and adjust the stopping knot accordingly to the amount of torque.

When climbing steeply with slow trim settings and high power output keep in mind the risk of stalling!

Due to typical PPG and PPGG feature - considerable vertical distance between thrust axis and wing chord - the range of safe power operation is closely connected to your skills and equipment.

Power-unit induced oscillations

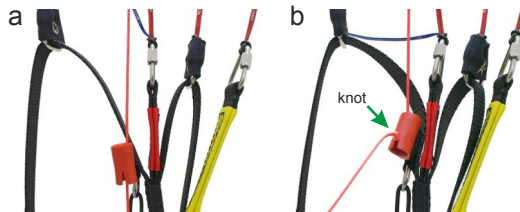
Certain configurations of engine weight, output and propeller diameter can cause serious oscillations, during which the pilot is being lifted to one side by the torque effect, swings down due to his weight, then is lifted again and so on. To avoid this you can:

- change the throttle setting and/or
- use the TEA system by fixing the line on the side opposite to the torque direction and/or
- shift yourself to the other side of the harness

The best method is to fasten opposite cross-bracing, or apply some weight-shift. Such oscillations usually occur at full power - the greater the engine output and propeller diameter, the bigger the swings. In addition pilot reactions are often too late or wrong, increasing the problem instead of solving it. In this case a simple way to deal with this question is to close the throttle and release the brakes.

Especially less-experienced pilots tend to overreact. This is called a pilot-induced oscillation, and proven solution is to leave the brakes alone.

TEA line non active (a) and active (b).



The effect of turning the paraglider away from the propeller turn direction can be neutralised by the TEA. The TEA knot can be put precisely where needed to completely stop the torque, and can be used in flight when needed.

Level flight

Once you have gained safe height after take-off and wish to go for a route, you can turn on the right direction, fully open the trimmers and let off the brakes. If the conditions are turbulent, it can look foolhardy, but this is the essential feature of the reflex profile - the faster you fly, the safer your Boson. That's why it's actually possible to release the brakes and enjoy your flight.

- **Caution:** Some pilots with previous free-flying paragliders experience may have a well-grounded habit of keeping the brakes slightly taut at all times. Such a technique, while quite reasonable on a free-flying wings as it allows for quick pilot reactions and decreases sink, is not advisable for reflex paragliders. When you pull the brakes, the Boson profile loses its reflex characteristics.

Good knowledge of weather conditions (e.g. wind at different altitudes) and smart use of thermals, convergence and other kinds of lift is another way of greatly reducing fuel consumption and increasing your flight range.

Trimmers and speed-system operation

The reflex airfoil of the Boson means safe operation of the trimmers and speed-system in a wide range. You are free to experiment with all possible settings, as long as you are on safe altitude. The trimmers belong to basic steering instruments. Their use should be widely understood, nevertheless we would like to underline some basic rules concerning safety.

- **Caution:** The trimmers must always be released (activated) symmetrically. Full release of just one trimmer will cause the paraglider to enter a turn, and extreme cases can lead even to a spiral. A canopy reacts to unsymmetrical trimmers depending on its model and current take-off weight (the bigger weight, the more dramatic reaction). The only exception from the symmetric trimmer operation rule are slight differences in settings necessary for course adjustments.

When you intend to release the trimmers, follow this procedure:

- grab the trimmer buckles,
- press the locks of both buckles with your thumbs,
- once you feel both locks to let go, allow the trimmer tapes to slowly slip out.

In this way you will be able to release the trimmers as much as you intended to, in a controlled action.

- **Caution:** Closing the trimmers should be symmetrical too, pulling both tapes simultaneously.

In case of unsymmetrical trimmer release:

- correct flight direction with a brake,
- release the other trimmer (when altitude allows), or close the previously released trimmer.

- **Caution:** Trimmers must be activated on a safe altitude, with enough margin for error.

- **Caution:** Fast releasing the trims results not only in rapid acceleration, but also increase of the sink speed! This can be a nasty surprise for less-experienced pilots flying at low altitudes. Fast releasing the trims results not only in rapid acceleration, but also increase of the sink speed! This can be a nasty surprise for less-experienced pilots flying at low altitudes.

Trimmers and reflex profile

Trimmers in the Boson affect geometry of the airfoil. At closed trimmers the airfoil features generates more lift with decreased reflex character. The more trimmer is released, the more reflex there is.

Fully opened trimmers increase the speed and stability of the wing, and with it also its ability to cope with turbulences and overall penetration. As forces on the brakes grow at high speeds, steering with TST handles becomes increasingly effective.

At fully opened trims we strongly recommend steering with TST handles (especially in rough air!) - using main handles can lead to side colapses. Turns executed in this way are slightly wider, but needed steering force will be smaller and airspeed will not decrease.

Slow trimmer settings decrease sink and steering forces, so it is possible to efficiently use the thermals.

Study drawings of trimmers and speed-system adjustment and setting, as well as their influence on the wing shape.

Remember:

- Trimmer setting is another part of the pre-start check list!
- If it will be asymmetric, the wing will be constantly turning.

Speed system

Works in the Boson exactly in the same way and in the same range as releasing the trimmers. Both systems can be used alternatively in various proportions as needed (observing the rules described below as for steering requirements in different speed modes).

In the configuration with fully released trimmers, the speed system operation range is limited.

- **Caution:** In calm air, Speed system can be used at any trimmer position! The increase of wind speed and turbulence must be assessed by the pilot who should consider the safety limits of the conditions before making any decision.

Speed and steering

We can discern three basic speed configurations (meaning setting of the trimmers and the speed system operation)

Trimmers completely closed (position 0):

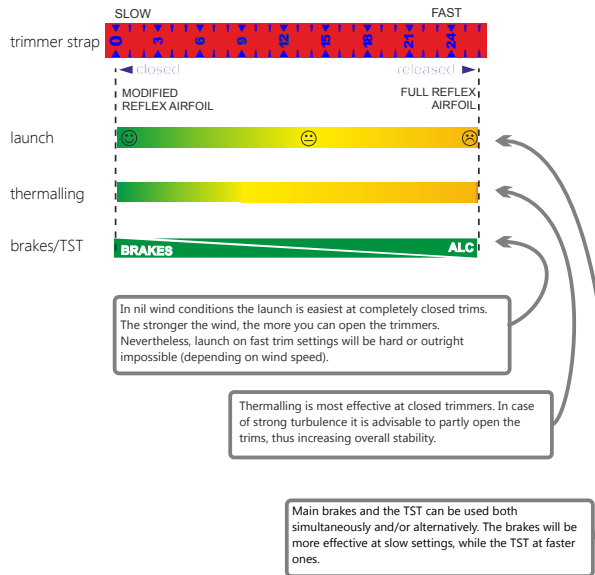
- pilot uses the steering handles.

Trimmers fully released or engaged speed system:

- pilot can use the steering handles, however with increased effort;
- steering the wing via TST handles will be definitively more effective.

Trimmers fully released with engaged speed system:

- In this configuration pilot should not use main steering handles,
- flight direction may be corrected only with the TST handle!



Slow mode

Trimmers completely closed (0)
Speed inactive

- slowest speed
- minimum sink
- thermalling

Risers' length*:

A - 540
A' - 540
B - 535
C - 500
D - 465

* lengths of the risers incl.
quicklinks, length tolerance +/-
5mm



Fast mode - speed system

Trimmers completely closed (0)
Speed activated

- Increased speed

Risers' length*:

A - 380
A' - 380
B - 415
C - 440
D - 465

* lengths of the risers incl.
quicklinks, length tolerance +/-
5mm

Accelerated mode

Trimmers fully released
Speed inactive

- increased speed

Risers' length*:

- A - 540
- A' - 540
- B - 550
- C - 630
- D - 710

* lengths of the risers incl.
quicklinks, length tolerance +/-
5mm



Max speed mode

Trimmers fully opened
Speed activated

- maximum speed

Risers' length*:

- A - 380
- A' - 380
- B - 417
- C - 563
- D - 710

* lengths of the risers incl.
quicklinks, length tolerance +/-
5mm



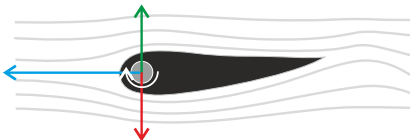
Influence of brake operation on the reflex profile

Pilots used to flying classic paragliders tend to „active“ piloting with their brakes always under tension. Flying a reflex wing like that is not only ineffective, but can be dangerous too.

The basic rule of flying reflex paragliders says:

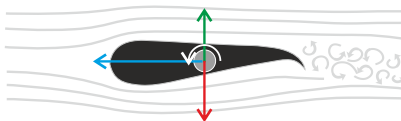
- Caution:** The faster you fly with the trimmer and / or accelerator, the more you limit the use of brakes.

Steering the paraglider in such configuration is most effectively done with systems like TST or ALC, designed specifically with that use in mind. Problem is demonstrated with following drawings.



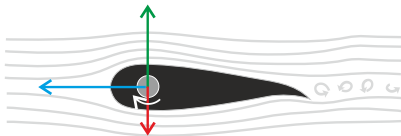
Released trimmers without using brakes

Typical configuration for fast and safe flying. Center of pressures of the aerofoil moves forward, practically excluding frontal collapses. Pitching moment increases the attack angle.



Released trimmers with brakes applied

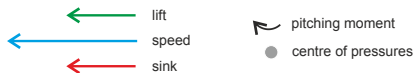
Even slight brake operation (especially when fully accelerated) will move the centre of pressures backwards, and the pitching moment will decrease the angle of attack. Additionally, the airflow is considerably disturbed. In particular cases this can cause a collapse. Steering can be necessary for heading corrections, nevertheless you should keep your brakes fully released when flying straight – otherwise the reflex feature will not work.



Closed trimmers

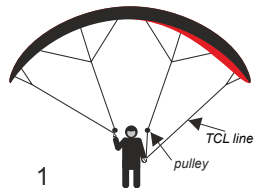
Using the brakes is a typical steering mode in this configuration and does not cause any danger. This setting is used during thermalling.

The canopy behaves much as classic profile paraglider, with slightly increased tuck resistance.

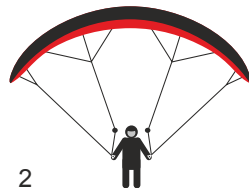


Beside you can see basic steering modes with 2D system. Demonstrated examples are by far not a complete catalogue – there is a lot of interim configurations and only the pilot will choose which steering mode he finds best in specific situations.

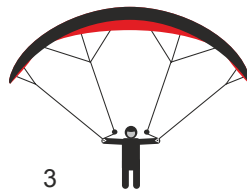
2D steering is considerably different than the classic steering system. The possibilities it offers are of special value for competition pilots. On one hand the 2D system offers much more precise control of the canopy, but on the other it requires learning new (different) reflexes and reactions. Pilot must spend some time exploring the system and perfecting his own technique before flying 2D in demanding environment of the competitions.



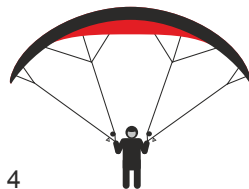
1
Classic turn – pull the brake handle down



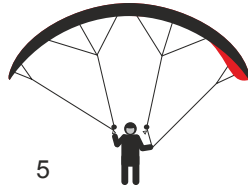
2
Classic braking - pull both brakes down.



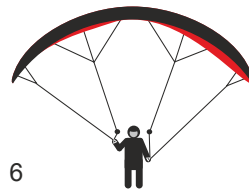
3
Hard braking the central part - push both brakes aside



4
Extreme braking the central part - pull the inner lines down



5
Tight turn – pull the outer TCL line down



6
Deep turn – pull the inner brake handle down, and push the outer brake handle a bit aside

Basically in PPG flying there are two kinds of landing: with and without power.

Power off landing

At an altitude of ca. 50 metres switch the engine off and glide as you would on a conventional paraglider. It reduces the chances of damaging the propeller on landing, but on the other hand there is only one attempt possible – it has to be done right!

With or without power Boson better copes with turbulence on faster trimmer settings. So, if the conditions are rough, it is better to make an approach with greater speed, plan a lot of space (as for a hangglider) and wear that speed off before touching down. Boson preserves the energy well, so there is a long float necessary to exchange the abundant speed for lift.

If the landing field is not big enough and you have to land on the spot, we advise you to close the trimmers. It will increase lift coefficient of the wing, simultaneously decreasing its sink rate and speed. Such an action is especially important when flying with high surface loading.

Powered landing

Make a flat approach with the engine idling, then level out and lose the speed before final flare. Immediately after touchdown switch off the engine.

The main advantage of this procedure is of course the possibility of a repeated approach if anything goes wrong. Still, if you forget to switch off the ignition before the wing falls down, there is considerable risk of damaging propeller, catching lines in it or even suffering injuries connected with falling on your running engine.

Remember:

- Whenever possible, get to know the landing field before taking off.
- Check the wind direction before planning the approach.
- Landing with power off requires much less space.
- In case of any doubt, practice the landing until you feel totally safe.

Free flying

Although the Boson according to its design book is a fast paramotor wing, it behaves surprisingly well as a classic paraglider too and can be used as such without any modifications.

The essential difference between the Boson and classic paragliders means that due to its increased tuck-resistance (both during start and flight) and greater speed range it can be safely flown in strong conditions too. Generally speaking the faster you fly, the safer is your flight.

The launch, flight and landing procedures of powered flying are not much different than those of the free flying, so we will not describe them in minute details here.

■ **Caution:** During launch always take care to properly pull the canopy up and forward. The reflex profile used in the Boson has an inherent tendency of increasing the angle of attack. Therefore if the canopy is not pulled enough, it can stay behind the pilot, rendering launch difficult and/or dangerous.

■ **Caution:** Operation of the PA (Power Attack) system is forbidden in free flying, in case of such flights it definitely should be locked. Reassemble the locking lines when free-

flying is intended..

Winching

Boson is not designed for winching. As mentioned before, reflex profile used has an inherent tendency to increase the angle of attack. While in normal flight such a disposition makes it safer, it can be dangerous during winching.

■ **Caution:** Winching can be done, but proper attention must be paid.

Golden rules:

- Never place the power unit downwind of the paraglider.
 - Check, double check and then check once again if there is no fuel leakage.
 - Do you have enough fuel for the flight? It's always better to take too much than too little!
 - Check if there is nothing loose in the harness, that could possibly contact the propeller in flight.
 - Whenever you encounter a problem, fix it AT ONCE however small it is!
 - Always put on and lock the helmet before getting in the harness.
 - Before each launch run a full pre-flight inspection.
 - After landing, control the wing facing the direction of flight, since turning you always risk getting lines in the propeller. Turn only if there is danger of falling on your back.
 - Do not ask for trouble - do not fly over water, between trees or power lines etc., where engine failure will leave you helpless.
 - Mind the turbulence caused by other gliders or even by yourself, especially when flying low.
 - It is not reasonable to let go of the brakes below 100 meters, because a possible power unit malfunction may require immediate attention.
- In general never trust your engine, as it can stop at any moment. Always fly as if it's exactly what it's going to do.
 - Unless it is absolutely necessary (e.g. collision avoidance), do not execute tight turns against the torque direction. Especially when climbing you can easily enter a stall and consequent negative spin.
 - Do not fly with tail wind at low altitudes, as it pretty much narrows your options !
 - Do not wait for the problem to grow - any change of engine sound or a vibration can indicate troubles. Land and check it out!
 - Be certain of your navigation.
 - Remember that not everyone is fond of your engine noise. Do not scare the animals.

Big Ears

In order to get the big ears you have to pull down the outer lines of the A' risers (usually distinguished with neoprene) by about 20-50 cm.

While inducing big ears you should never never let the brakes out of your hands.

After tucking the tips in, Boson will continue to fly straight with increased sink rate (up to 5 m/s). You can steer the wing pretty efficiently with weight-shifting.

After releasing the lines, the paraglider will usually open up on its own or you can assist it with a long stroke of the brakes. For the sake of safety (the possibility of a parachutal stall) it is reasonable to engage speed system after pulling big ears in order to lessen the angle of attack of the wing centre. Executing big ears with open trimmers is very difficult due to the reflex profile stabilisation.

- **Caution:** Never try to pull big ears during powered climb, as the increased drag of the ears can cause excessive angle of attack and a parachutal stall. Besides, pulling the ears while climbing is pointless anyway.

B-Stall

B-stall can be executed only with fully closed trimmers.

To enter a B-stall you have to simultaneously pull both B-risers (yellow) down by 10 - 20 cm. The wing collapses on its entire span along B-row, the airflow over the top surface will break and the canopy projected surface will be significantly reduced. Forward speed will die and you will be descending almost vertically.

Further pulling of the B-risers is not advised, as the wing instability can grow.

This manoeuvre is rather hard to execute on the Boson due to great forces required to pull in the B riser.

- **Caution:** To exit a B-stall, the risers should be released in a smooth and decisive manner.

On quick and symmetrical releasing B-lines the airflow will be reinstated and the wing will surge forward, returning to normal flight. If the canopy forms a horseshoe with the wingtips in front of you, gently apply both brakes to recover.

Spiral dive

A spiral is characterised by reaching the highest sink rates possible.

Significant G-forces, however, make it difficult to sustain a spiral dive for a long time, as it can place high loads on both pilot and glider, to degree of losing consciousness by the pilot. Never do this manoeuvre in turbulence or at too high bank angles.

Control the dive and do not exceed 16 m/s sink. If the dive is not stopping after releasing the brake, assist the glider with the outer one.

- **Caution:** Never execute manoeuvres generating high G-forces (spiral dive, dynamic wingovers etc.) on released trimmers, as this is very dangerous!
Releasing the trimmers shifts the loading centre of the canopy forward, toward leading edge. This rule affects all paragliders, but the more reflex is present in the airfoil, the more aggressive is that effect

A typical reflex paraglider on released trimmers shows following load distribution according to line rows: A=60%, B=30%, C=5%, D=5%.

Taking over as much of the load by the A and B rows of the reflex

canopies (90% in total) brings about their praised stability.

However, in connection with a dynamic manoeuvre which a spiral dive is, it can shift the load dangerously close to its maximum value. Similar situation occurs when executing spirals or wingovers with big ears pulled. That's another example of concentrating whole load on reduced wing area, which - combined with high G manoeuvres - shifts the peak loads unnecessarily close to their maximum values.

Wing over

You make a wingover by performing a series of consecutive, alternating turns with growing bank angle. Too aggressive banking with insufficient control can result with a massive collapse.

Aerobatics

Boson was not designed to do any aerobatics.

- **Caution:** All rapid descent techniques should be practiced in smooth air and only with sufficient extreme manoeuvres altitude margin! Full stalls and spins are to be avoided as they are not recommended techniques of clearing dangerous situations.

■ **Caution:** Due to high resistance of the Boson against both side and front collapses, we strongly recommend not to provoke such situations at all, even during safety trainings. Inducing collapses in standard way can be very hard to impossible, while unconventional attempts can result in extremely violent and dynamic behaviour.

■ **Caution:** Extreme flying manoeuvres should only be carried out during safety training courses (instability training) under proper guidance!

One sided collapse

Can happen in strong turbulence.

With collapses up to 50% pilot has a couple of seconds to react before the wing will enter rotation. Standard counter-steering is enough to keep the paraglider on course.

Under normal conditions the canopy will reinflate instantly and spontaneously.

Frontal collapse

The reflex profile of the Boson makes it practically impossible,

especially at higher speeds. During tests we succeeded in creating this situation only with fully closed trimmers and using special measures. Such forced collapses can lead to extremely deep collapses, so recovery will require decisive pilot action (short and equal application of both brakes).

Full stall and negative spin

May happen only as a result of serious neglect or intentional action of the pilot. You have to be careful when flying at very low speeds until fully familiar with brake operation.

The canopy recovers spontaneously in initial phase of stall, otherwise use standard procedures.

Deep stall

Under normal conditions does not occur. If you want to prevent it at all, simply stick to a couple of rules:

- after B-stall, release the risers quickly and evenly. Don't be afraid – the wing does not jump forward excessively.
- after big ears execution, engage the speed system. This will increase both the sink rate and safety margin, as big ears constitute an effective aerodynamic brake with significant loss of

speed..

Nevertheless, if such a parachutal stall happens, simply apply some pressure on speed bar and/or push the A risers forward.

Line over and cravatte

Boson is a modern wing which, in order to decrease drag has fewer suspension lines and greater distances between them. Therefore it's always possible that after a tuck one of the stabilisers may tangle in the lines. Usually a couple of pulls with a brake settles the matter. If it's not enough, try to untangle it with big ears or a stronger pull on the risers.

- **Caution:** In case of any doubts you should seriously consider throwing the rescue chute.

Emergency steering

In case of any malfunction that renders normal steering impossible, you can safely steer and land Boson using the D-risers (blue cover) or stabilo lines.

Packing and storage

Boson design incorporates modern technologies, including nylon lines in the leading edge. That's why the paraglider should be carefully packed, with proper conditions ensured for transport and storage.

Basic rules to be followed when folding the canopy:

- Fold it accordion-wise rib to rib (cell by cell). Do not fold it by halves, placing the stabilizers at the centerline.
- When a compact package is created on the longest chord do not roll it, but fold three to four times (depending on the chord length) from trailing edge towards the leading one.
- The leading edge remains on top of folded canopy.
- Never pack you paraglider too tightly.
- Optionally pack the wing into a dedicated WingShell.

If you have completely prepared your gear but have to wait for launch, a good idea is to use a quickpack, to protect your wing against moisture and UV rays.

Never pack or store the glider when wet, as it significantly shortens life of the fabric. Remember that the wing becomes damp even while lying on green grass in direct sunlight, as the grass transpires.

- **Caution:** Locking a wet paraglider in a car exposed to sun is absolutely unacceptable! Hot car interior acts like an oven and tests have shown that color bleeding/transfer can happen even at 50 Celsius degree. The warranty does not cover such damages!

While drying, never expose your paraglider to direct sunlight operation.

Store the paraglider in a dry place, away from chemicals and UV exposure. Ideal storage temperature for the paragliders is 5 to 25 Celsius.

Cleaning

Clean the paraglider with water and a soft sponge. Do not use any chemicals or alcohol, as these can permanently damage the fabric.

Deterioration - a few tips

The paraglider is made mainly of Nylon - a fabric which, like any other synthetic material, deteriorates through excessive exposure to UV rays that come with the sunlight.

Hence it is recommended to reduce UV exposure to a minimum by

keeping the paraglider packed away when not in use. Even when packed in a bag, it should not remain in the sun for long.

Suspension lines in this paraglider consist of Technora inner core and polyester sheath.

Submitting them to excessive bending and loading in flight should be avoided, as it can cause irreversible damage.

Please note that with frequent kiting on a field or a small hill your paraglider will deteriorate more quickly due to its repeated rising, falling and being dragged around.

Uncontrolled strong wind takeoffs or landings can result in the leading edge of the canopy hitting the ground hard, which may seriously damage the ribs, sewing and surface cloth (including coating damage).

Keep the paraglider clean, since getting dust in the lines and fabric will reduce their durability.

Be careful to keep snow, sand or stones from entering the cell openings: their weight can slow or even stall the glider, while sharp edges can damage the cloth.

Prevent lines from catching anything, as they can overstretch or tear. Never step on the lines.

Knots can chafe suspension and/or brake lines.

Check the length of your lines after tree or water landing, as they can stretch or shrink. The lines can be measured at the manufacturer or an authorised workshop.

After landing in water you should check the wing fabric as well, since the wave forces can cause the fabric to distort in some areas.

When taking the wing out of the water, always do this by trailing edge. After a sea landing, rinse the paraglider with fresh water.

Since salt crystals can weaken the suspension lines even after rinsing in fresh water, you should replace the lines with new ones immediately after contact with salt water.

Frequent flying near oceans and seas accelerates deterioration of the paraglider, as salt present in the sea breeze can make the lines stiffen and even break.

Repairs

Repairs should only be carried out by the manufacturer, authorised distributor or an authorised workshop. It is acceptable to fix minor cloth damage with self-adhesive patches included in the package.

Inspections

Full Inspection is recommended every 24 months or every 150 hours whatever comes first, if not advised otherwise by the inspecting person due to paraglider's condition.

In case of paragliders used commercially (e.g. in schools or tandem flying) a Full Inspection is recommended every 12 months after first 24 months from purchase date or every 100 hours airtime (whatever comes first).

A paraglider can be officially inspected only by the manufacturer or a dealer (authorised to do so).

We are aware that purchase of a new paraglider is a big expense for every pilot. That's why we guarantee quality of our products, as well as optionally we are offering a security system that will allow you to insure your paraglider against possible damage and repair costs with an AeroCasco insurance.

Warranty:

Dudek Paragliders guarantees free of charge repairs in case of damages caused by the material or production flaws:

For the free-flying paragliders warranty covers 36 months (3 years) or 300 flight hours, whatever comes first. If the free-flying paraglider is used for powered flights, every hour flown is counted double (not concerning PPG paragliders).

36

36 Months Warranty

24

24 Months Warranty

18

18 Months Warranty

For the paramotor canopies (PPG) warranty covers 24 months (2 years) or 200 flight hours (whatever comes first). For the mountain wings (MPG), speedflying, schools or professional users warranty covers 18 months (1,5 year) or 150 flight hours (whatever comes first).

Warranty does not cover any of the following:

- canopy colour fading as well as bleeding caused by improper storage/transport
- damage caused by chemicals or salt water
- damage caused by improper use
- damage caused in emergency situations
- damage resulting from accidents (airborne or otherwise)
- consumables (e.g. trimmer tape)

Warranty is only valid if:

- flight hours can be identified basing on properly kept logbook of the owner (and his possible predecessors) with marked PPG hours.
- the paraglider is used in accordance with the operating manual
- the owner did not make any repairs by him/herself (excl. minor repairs with self-adhesive patches)
- the owner did not make any modifications
- the paraglider can be unmistakably identified by data sheet/sticker
- the paraglider has been properly inspected at all times.

- ! **Note:** In case of damages caused by the material or production flaws please contact the dealer that sold you the gear. The dealer will determine further actions.

If you have bought the paraglider second-hand, ask previous owner for a copy of his logbook (covering entire use of the paraglider from the day of original purchase).

AeroCasco



Standard warranty does not cover repair costs of damages caused by the user or a third party. Since costs of such repairs can be considerable, Dudek Paragliding offers an

AeroCasco insurance. It offers a one time repair of any mechanical damage, no matter how big and who caused them.

The only expenses you will be facing are shipping costs and the share-of-cost amount. AeroCasco can be purchased for a brand new paragliders only (at the purchase). The AeroCasco costs 50 Euro.

- ! **Note:** AeroCasco is not available for all paragliders (check before purchase). It can be purchased only for privately used paragliders.

AeroCasco covers only damages occurring while taking-off, flying or landing. Obviously, all faults in the material and manufacturing flaws are covered by normal warranty.

When handing the paraglider for the repair you have to present a card confirming its AeroCasco status. After the repair you will have to cover only the share-of-cost value of 50 euro. AeroCasco is valid for one repair only during covered time.

There is a possibility of extending AeroCasco for one further year. To do this you have to send your paraglider for inspection to the manufacturer not later than a year after the date of purchase. The AeroCasco extension fee is 75 EUR (including inspection). Remember to include the AeroCasco confirmation when you send the paraglider for inspection.

AeroCasco does not cover any of the following: theft, canopy discoloration, damages caused by incorrect storage damage of transport, damages caused by chemicals, salt water or force majeure.

Environmental care

Paragliding is an outdoor sport.

We believe that our clients share our environmental awareness.

Exercising paragliding you can easily contribute to environment preservation by following some simple rules. Make sure you are not harming nature in places where we can fly. Keep to marked paths, do not make excessive noise, do not leave any garbage and respect fragile balance of the nature.

Recycling of used gear

A paraglider is made out of synthetic materials, which need to be properly disposed of when worn out.

If you are not able to dispose of the paraglider properly, DUDEK Paragliders will do that for you. Just send your paraglider to the address given at the end of the manual, accompanied by a short note.

The Dudek paraglider you bought should include following items:

- DewBag
- Transport bag (with your canopy inside)
- The paraglider itself (canopy, lines and risers)
- Compression strap to keep the canopy together
- Wind indicator (windsock or a strap)
- Pocket with paper work and repair wallet including:
 - Piece of self-adhesive fabric (10 cm x 37.5 cm) for small repairs. Note that even small tears located in the vicinity of stitches are to be repaired by an authorised service only.
 - Looped and stitched suspension line (the longest of all lines in the paraglider) to be used as a temporary replacement. Do not cut it if you have to temporarily replace a shorter one, just tie it at the length needed.
 - Paraglider passport with entered date of purchase and valid technical inspection (please check the serial number with the sticker on wing tip).
 - USB drive with this manual.
- Small gifts

Boson	31	34
Dopuszczenie - Identyfikacja ULM	-	-
Liczba cel	60	60
Powierzchnia w rozłożeniu [m ²]	31,00	34,00
Powierzchnia w rzucie [m ²]	26,73	29,32
Rozpiętość w rozłożeniu [m]	13,52	14,16
Rozpiętość w rzucie [m]	11,06	11,58
Wydłużenie w rozłożeniu	5,90	5,90
Wydłużenie w rzucie	4,57	4,57
Prędkość opadania [m/s]	min = 1,4 + - 0,3m/s	
Prędkość postępową [km/h]	min= 35; trym = 45 - 65; max = 70 + - 5km/h	
Najdłuższa cięciwa [m m]	2806,00	2939,00
Najkrótsza cięciwa [m m]	745,00	780,00
Długość linek z taśmami nośnymi [m]	8,12	8,50
Łączna długość linek [m]	386,55	446,79
Całkowita masa startowa [kg]	140 - 260	170 - 300
Maksymalna masa startowa - zawody [kg]	300*	350*
Dystans między taśmami [cm]	60,00	60,00
Waga [kg]	7,56	8,20

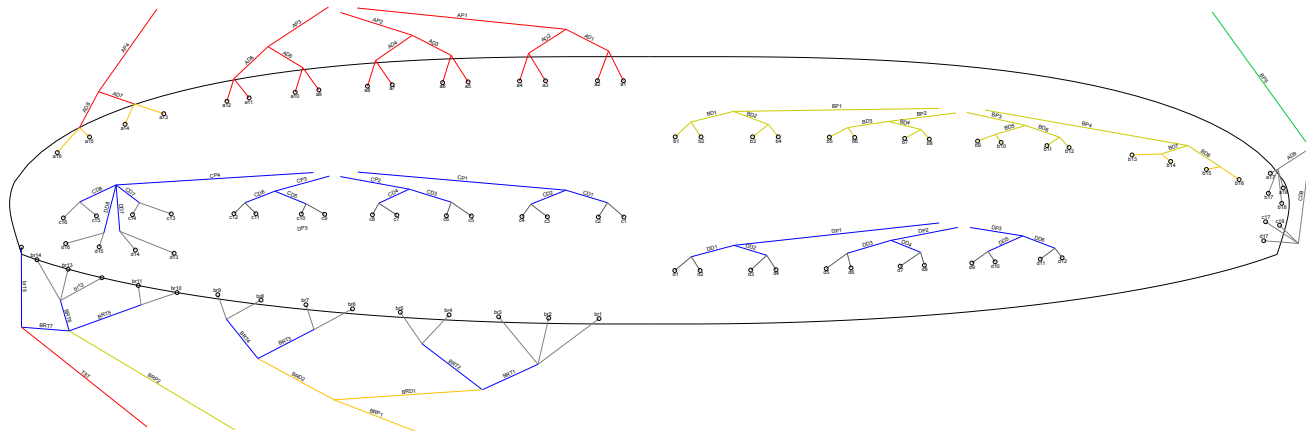
Boson	
Linki	A-8000U: 050; 090 / Technora: 90; 140; 190; 280; 340 / Dyneema: 350
Tkanina	Porcher Classic 38 g/m ²
	Dominico tex 34 g/m ²
	Porcher Hard 40 g/m ²
	SR Scrim, SR Laminate 180 g/m ²
TaTmy noTne	PASAMON - Bydgoszcz, Polska

* Detailed list of materials used for the manufacture can be found in service documents file on the page of a wing, available on our website www.dudek.eu

The rigging scheme itself is published on the next page, while tables of line lengths you will find in attachments to this manual.

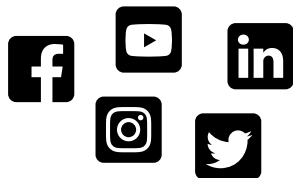
Lengths are measured with a specialised, computer-operated device. All the lines before measurement are stretched with a steady 5 kg load. Thanks to abovementioned device and proper procedures, final tolerance of line lengths does not exceed +/- 10mm.

- **Note:** Distances given below are to be understood as distances between connection points. When cutting a line for repair, **20 cm extra must be added**, as at each end a 10 cm stitch is required to fix the loop. The only exception is the main steering line (BRP), which is looped only at the upper end, with at least 15 cm margin for fastening brake handle (this means for this line extra 25 cm than in the table is needed).



By purchasing our gear you've become an important part of Dudek Paragliders family!

Share your experiences with the entire community and stay current with new offers by joining our fanpages:



Movies and pictures

If you have interesting photos and films of your flying by all means send them to us, and we will share them with our entire community: media@dudek.eu

Do not forget to label everything you publish in social media with [#dudekparagliders!](#)

Need any help?

- Do you want to fly with us, but are not sure which paraglider should you choose?
- Are you already our pilot, but would like to know more details concerning your wing?
- Or maybe you seek advice in honing your skills?

Write us! Send an email to support@dudek.eu and our specialists will answer all your questions!

If you respect the rules of safe flying and proper glider care, you will enjoy many years of pleasant airtime on your Boson. Still, you must be aware of possible dangers and face them wisely.

You must accept the fact that all air sports are potentially dangerous and your actual safety depends solely on you. We insist that you fly safely, and this concerns both the weather choicesafety margin during all manoeuvres.

- **Caution:** Flying the paragliders is always your own responsibility!

See you in the air!



photo by Krzysztof Romicki



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