



Risen by Swiss Excellence Airplanes (SEA)

Press Information

Discover the difference

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SEA's ambitions when developing the Risen were high: Creating an exceptional performer of innovative design, with unparalleled efficiency and safety, luxury interior and top level avionics. With its innovative shape, the extended nose and the V-tail the Risen is already an eye-catcher in the ultralight category. Still this shape was not just developed for standing out from the rest. There is no single part in particular that enables the Risen reaching top speeds, it is the whole plane. Every little detail is designed in a way to increase the performance and making the aircraft more aerodynamic. The Risen offers a new dimension in terms of speed, efficiency and modern features making it a trailblazer and setting new benchmarks for the future of ultralight airplanes.

With the Risen SEA wants to offer an aircraft that brings a new experience of flying and leaves the customer happy without any wishes. The advantages of an ultralight aircraft are connected with the performance and equipment of larger upper-class sports aircraft making the Risen even interesting for pilots with a non-ultralight background. The easy handling and the improved stability even at high speeds combined with several comfort functions bring an experience of sheer flying pleasure.

From the first sketches to a world record

For SEA the Risen is the first aircraft in production. It was presented at the AERO in Friedrichshafen in 2015. However, the idea of designing an own aircraft was already born in 1995 after Alberto Porto's consulting company Porto Ricerca had been involved in projects of well-known European aircraft manufacturers. The dream was to create an ultralight aircraft, which impresses not only with exceptional performance but also with unparalleled efficiency and safety.

Instead of optimizing already existing shapes he started from scratch trying different versions in the company's own simulation software for aerodynamics. The construction of the prototype finally started in 2010. On the sunny morning of March 12, 2012, the Risen made its maiden flight even overtaking the calculated performance of the simulations. The first word the test pilot said after landing was: *"Unbelievable!"*

This prototype was tested and optimized for three years and still flies today. The first production aircraft was unveiled on the 15th of April 2015 at the AERO, in Friedrichshafen (Germany), a global exhibition for general aviation. From the first ideas to the presentation of this final version 20 years passed by and also other companies worked intensively on the improvement of ultralight aircraft. Still the Risen belongs to the leading airplanes of the category. The glide ratio of 1:23 is the highest achieved by any ultralight aircraft up to now.

The performance in terms of speed was proved in 2015. With 323.82 km/h the Risen broke not only the official FAI record of the sub-class RAL2T, but even the absolute speed record of the class R (Microlights and paramotors). The previous record of 300.5 km/h was set by a tandem seater with a modified engine and a particular propeller just made for this event, whereas the Risen broke this record as a serial production with a Rotax 912 ULS and no modification. The FAI even rewarded the record with the De la Vaulx Medal. This official approval makes the Risen the world's fastest ultralight which is available on the market at the moment.

Basic technical data:

| | |
|-----------------------------|---|
| Wing Span | 9.00 metres |
| Wing area | 9.7 m ² |
| Length | 6.80 metres |
| Height | Fuselage 1.7 m, tail 2.1 m |
| Empty Weight | 297 kilogram |
| Max. Take-off Weight | 575 kilogram (472.5 kilogram) |
| Cabin Width | 1.23 metres |
| Max. Load Factor | +5.5 g / -3.5 g |
| Fuel Tanks | 2x 43 litres, can be extended up to 2x 100 litres |

No detail left to chance

The famous writer and pilot Antoine St. Exupery once wrote:

“In anything at all, perfection is finally attained not when there is no longer anything to add, but when there is no longer anything to take away, when a body has been stripped down to its nakedness.”

This principle is still valid today and was followed by the developers of the Risen, reducing the shape to minimize aerodynamic resistance giving the Risen a futuristic look. Nothing was left to chance when the shape of the aircraft was developed. All curves are refined and optimized creating a new dimension of aerodynamics and efficiency giving the Risen a sportive and sleek appearance.

The whole airframe is made of composite. The carbon fibre brings the advantage of a light weight combined with a high stiffness and strength (excellent strength to weight ratio) and corrosion resistance.

The V-tail reduces the interference drag to just 2 points, making it more efficient. The very large surface of the Risen's V-tail has a positive effect on the stall and makes it better to control even in difficult situations. Also it is designed in a special way enabling the aircraft to recover easily from a spin.

The wing of the Risen is not a standard profile as it combines the advantages of several different profiles. Winglets are usually not used as there is no need for them for high speed cruise at a low altitude with a low wing load. The stall tests confirmed the calculated results from the simulations and showed that thanks to the special wing shape, the Risen is controllable very well as the stall does not affect the whole wing area.

The Fowler flaps are very unusual for an ultralight aircraft, but have been chosen for a good reason. They create a stronger uplift and in this way guarantee a low stall speed of just 55 km/h with flaps despite an increased weight due to the equipment and retractable gears. Fully extended flaps increased the wing area by 1.7 m². The positions for take-off and landing are saved in the computer and can be adapted.

The regular version of the Risen has an electric trim system for the elevator and rudder. The elevator trim is working for a horizontal flight from 120 km/h to 315 km/h and is located at the control stick to make the trimming easier.

The main landing gear and the bow legs are made of carbon-fibre to give them a high stability. To create a larger gap between the propeller tip and the ground despite the flat fuselage and ensure a safe landing even at unpaved runways the Risen has a quite long gear. The gear is retracted by an electric system, which brings the advantage that even in case of an

engine failure the landing gear is going to work. In case of any problem there is a secondary system. The landing gear is operated by a switch in the middle of the dashboard with three LED lights indicating the state of each wheel. When seeing the Risen in flight from below you will realize the sleek belly. The landing gear disappears completely into the hull and the landing gear bay is completely covered.

The wheels and hydraulic disc brakes come from the French manufacturer Beringer. They are designed to provide an increased stopping power and reliability while also reducing maintenance efforts. The alloy is made of high strength aluminium, which is anodized for an improved corrosion resistance.

The brakes are controlled by foot pedals. Also included is an anti-skid ALAIR system. The Risen is always equipped with a parking break and also tie-down eyes can be hidden in the wing for additional safety if it is left at an outside position. The aircraft has been developed at an airport with a grass runway, so it is also suitable to land there.

After doing some research on the existing propellers on the market SEA finally decided to develop an own one made of carbon fibre with a diameter of 1.7 metres. This SEA 2-blade, in-flight variable pitch propeller is optimized for the shape of the Risen and unlocks the full potential of the aircraft. The electro-hydraulic control system is made by Idrovario (Alisport).

For transport the wings and the V-tail can be disassembled. Also different trailers are available on customer request.

Guaranteeing a high level of performance

SEA is very concerned of giving honest values for the performance. Values which have not only been calculated but also have been confirmed in practice. For this reason the given maximum horizontal speed is a guaranteed speed that also written down in the contract. The actually achievable speed is above 315 km/h with the Rotax 912 ULS.

The never exceed speed given by SEA is 350 km/h; even the aircraft was tested up to 390 km/h without any problem SEA wants to ensure a high level of safety.

The performance varies as the Risen is available with three different engines: the Rotax 912 ULS, the 912iS and the 914 Turbo. With the 914 Turbo guaranteed maximum horizontal speed at FL90 is 355 km/h. Also the Rotax 915 will be available in the future and will increase the speed to 390 km/h. This requires re-enforcements of the structure to increase the Vne.

| | Rotax 912 ULS | Rotax 912iS | Rotax 914 Turbo |
|--|----------------------|--------------------|------------------------|
| Max climb rate | 7.5 m/s | 8.0 m/s | 8.5 m/s |
| Cruise speed (@75%)* | 290 km/h | 295 km/h | 300 km/h |
| Max <u>guaranteed</u> horizontal speed* | 315 km/h | 320 km/h | 330 km/h |
| Never exceed speed (VNE)* | 350 km/h | | |
| Stall speed with flaps | 55 km/h | | |
| Best climb speed | 160 km/h | | |
| Maximum gust intensity speed | 290 km/h | | |

*at sea level

Discovering what is behind the horizon

Advanced analysis of fluid dynamics did not only increase the speed, but also improved the efficiency making the Risen a leader in its class. With a range of up to 2360 kilometres with the standard fuel tanks (86 litres) and the Rotax 912 IS the Risen enables the pilot to discover what is hidden behind the horizon. Of the 86 litres 84 litres can be used without any problem. With the long range cruise speed of 190 km/h it is even possible to go from Lugano to destinations like the Faroe Islands, Marrakesh or Saint Petersburg.

Rotax 912 IS

| | Speed | Consumption | Range |
|--------------------------|--------------|--------------------|--------------|
| Long Range Cruise | 190 km/h | 6.5 l/h | 2,360 km |
| 55% Power Speed | 230 km/h | 9.5 l/h | 1,919 km |
| 65% Power Speed | 262 km/h | 13 l/h | 1,562 km |
| 75% Power Speed | 290 km/h | 17 l/h | 1,288 km |

Rotax 914 Turbo

| | Speed | Consumption | Range |
|--------------------------|--------------|--------------------|--------------|
| Long Range Cruise | 190 km/h | 9 l/h | 1,678 km |
| 55% Power Speed | 230 km/h | 12.5 l/h | 1,413 km |
| 65% Power Speed | 262 km/h | 17 l/h | 1,276 km |
| 75% Power Speed | 300 km/h | 20 l/h | 1,110 km |

The high cruise speed of 290 to 300 km/h combined with the low consumption makes the Risen also a great choice for business travellers. The fuel capacity can also be increased up to 200 litres in total, which results in a range of about 5,500 km without any need of re-fuelling.

Safety by choice, not by chance

Another important aspect during the development of the Risen was to improve the safety of the aircraft. Two anti-firewalls separate the engine mount from the cockpit for an increased safety. The battery and some sensitive parts of the engine electronics are located between the first and second wall. The Dynon SkyView includes a collision warning system.

Additionally there is a warning system that indicates early enough before the aircraft reaches limits or if there is a technical problem. Also it warns the pilot for example when he forgets to lower the landing gear. Also better visibility in difficult light and weather conditions helps to prevent accidents. For this reason the Risen is equipped with three navigation and three strobe lights.

Beside the high stability and the good handling even in difficult situations, several steps have been taken to increase safety in case of an engine failure or emergency landing.

As fuel leakage often causes fires in case of an emergency landing SEA decided to install anti-explosive and anti-crash tanks. The tanks are made by M.E.R.I.N and located behind the main spar – the safest position available in the wing.

The self-winding seatbelts guarantee a good support in case of an emergency landing without the need of tightening. The belts have a manual lock and are produced by ASF, a well-known German company with a long experience in this field.

The Risen also has a ballistic parachute system. In case an emergency landing is not possible due to the terrain or a loss of control, the pilot can pull the handle and a rocket with a parachute will exit behind the baggage compartment bringing the aircraft relatively smoothly to the ground. The installed rescue system is made by Galaxy, a Czech company with more than 30 years of experience and has a maximum deployment speed of 350 km/h.

Dashboard & Controls

Also when it comes to Avionics the Risen offers the latest technologies for general aviation. The basis version is delivered with a full-glass cockpit, so it includes three Dynon touch monitors: Two 10" positioned in front of the pilot and passenger and one 7" in the middle of the dashboard.

The Dynon SkyView system has very bright, high resolution screens, so even in sunlight it is easy to read them. Also during the flight the touch function and additionally two joysticks and a row of buttons make it easy to use. The 3D depictions of runways, obstacles and the terrain are thought to increase the situational awareness; still it is also possible to change to the SkyView "six-pack" mode, which bridges modern features with retro analogue gauges. Each module has an own system battery backup ensuring another at least one hour power in case of a battery failure.

Alternatively the Risen will also be offered with Garmin avionics soon. Both companies are known providers for the latest technologies and upper class equipment the Risen is promising. Nevertheless for customers preferring analogue instruments individual changes can be negotiated.

The engine throttle is located in the middle between the two seats. The brakes are controlled with the feet. If requested the co-pilot seat can as well be equipped with brakes. The control stick is available in different designs.

More Comfort - even at long journeys

The fully-equipped Risen includes the Dynon SkyView dual-axis autopilot, so there is no need of holding the stick all the time when the customer goes for a long flight. The Dynon autopilot can fly magnetic heading, GPS ground track, and horizontal NAV, so it can follow the directions the pilot chooses, but also it can follow a flight plan.

The seats are filled with memory foam, so they adapt to the body shape and offer maximum comfort. The cover in the basic version is made from leather, but if customers prefer Alcantara or other material there is the option of an upgrade. As all seats are custom-made also other material is possible. The Risen also has removable headrests to ensure maximum comfort and safety. The ASF 4-point, self-winding seatbelts are available in many different colours and included in the price.

For the fresh air and heating system the customers have different choices. The regular full-equipped Risen is delivered with a cabin heat-control system with forced air during taxiing and lading. A windshield defrost system is available on customer request.

Enjoying the flight with a better sound & a breath-taking view

The radio and transponders delivered with the regular version of the Risen are also coming from the Dynon SkyView range. As well included in the package are two Bose A20 headsets with active noise reduction and Bluetooth. Bose is one of the leading companies, not only for sounds systems, but also for aviation headsets. Thanks to the Bluetooth it is easy to connect with a mobile device for answering calls or listening to music, so the customer can fully enjoy the flight.

The canopy is motorized and can be opened with a switch, but if the customer prefers it can also be changed to a manually opening system. The acrylic glass is made by Weiss, a German company, and is available as a clear version or a tinted one in different colours. Whatever colour is chosen, it is ensured that with a total surface of about 3 m² the pilot and passenger can enjoy a breath-taking view.

The Risen Customer Philosophy

The offered version already includes all top level equipment a pilot could desire, so no upgrades are needed and no compromises done. Of course the customers can add extra equipment or ask for modifications if there are any needs that are not covered. The goal is to deliver an upper-class ultralight aircraft that is tailor-made, not only in terms of design, but also in terms of the configuration.

The painting and the interior design and colours are chosen by the customer. For the cockpit design three different options are available: Aluminium look (Sport), carbon look (Race) or wood look (Elegance). Also the colour of the seats, stitching and seat belts can be chosen by the customer. In this way every customer will have a unique aircraft that matches the desired look.

Extra services and little gifts are also included in the package like SEA bags fitting perfectly into the baggage department and a Nomex pilot suit. To ensure that no questions about the handling will be left open the pilot will get a flight training. For the aircraft the service package includes a two-year or 200 flight hours warranty including SEA assistance and on-site inspections.

SEA seeks in thrilling the customer not only with an exceptional product and an unmatched flight experience, but also with dispensation of wrong promises. The given maximum horizontal speed is guaranteed in the contract and by breaking the world speed record the Risen confirmed its performance – all as an unmodified, regular production version.

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The price for the regular (fully-equipped) Risen* offered by SEA includes:

- Rotax 912 ULS
- SEA 2 blade electric / Hydraulic constant speed propeller
- Cabin heat control system
- Electric elevator & rudder trim system
- Flap control computer
- Personalized painting, including registration marks & personalized decals
- Puriplane super-efficient surface polishing
- A tinted canopy (colour can be chosen)
- Motorized canopy opening system
- Leather Seats (colour can be chosen) including 2x removable leather headrests
- self-winding 3-point certified ASF seat belts (colour can be chosen)
- One of 3 cockpit designs: Aluminum look (Sport), carbon look (Race) or wood look (Elegance)
- 2x 43 litres anti-explosion & anti-crash fuel tanks
- 3 navigation and 3 strobe lights (LED)
- Beringer high performance wheels & brakes incl. anti-skid ALIR system
- Wing un-heated Dynon pitot tube with angle of attack indication
- Ballistic rescue system GRS 6/473 SD with container
- 2x SkyView 10" SV1000 Touch Screen (Inc. EMS, OAT, MAP, F.P., GPS)
- 1x SkyView 7" SV700 Screen (Inc. EMS, OAT, MAP, F.P., GPS)
- SkyView Autopilot + 2 servos SV32 & SV42
- 2 Bose A20 headset with noise reduction and Bluetooth
- Radio Dynon SkyView VHF Com SV-COM-C25/V (8.33 kHz) (Vertical or horizontal display)
- Transponder (Integrated module SV-XPDR-261 Class 1 S-mode)
- Radio wiring + antenna
- Removable wings and tail surfaces
- 3 Risen marked bags Dimensions
- SEA nomex pilot suit
- Flight Training package
- 2-year or 200 flight hours warranty including SEA assistance and on-site inspections

*Modification to customer request is possible.