ULTRALIGHT

CZECH REPUBLIC

Sting S4

The next generation brings new possibilities...

History

The TL-Ultralight aircraft company was established in 1989. The company owner, Mr. Jiri Tlusty designed powered hangliders which were the first product with an engine. Later motorized trikes were successfully added to the product line but Mr. Tlusty had even bigger plans.

In 1991 TL began serial production of the TL 32 Typhoon, a fixed wing, 2-seater, constructed with a tubular metal frame. The Typhoon aircraft became very popular for flight training and introduced a whole new pilot generation to the wonders of flight. It was also a very economic aircraft for recreational flying. The successful Typhoon had become a legend in the Czech light aircraft history. Its popularity pushed production to over 200 aircraft.

Within four years of operation another new design was introduced to the aviation press. With Tlusty's leadership, TL began production of an affordable metal high wing aircraft called the Condor. It too was a great success and in two variants, the Condor TL 132 and TL 232, production exceeded 300 aircraft.

Planning ahead, TL pursued ever more sophisticated designs and materials. In 1996, Mr. Tlusty brought to the market a completely new concept, the TL 96 Star. A very modern design, the Star was a low wing, fully composite aircraft which sets both performance and market class records at the time.

By 2000 it was clear to TL that composite design and fabrication was the method to provide customers with a sleek and low drag airframe. Using the best features of the Star the TL design team added a new high performance wing, an anti-servo elevator and low drag conforming engine cowling. Thanks to total effect of these design innovations there was a new member of the TL family, named the TL 2000 Sting Carbon. This exciting aircraft is manufactured in serial production in several options, a Light Sport (LSA) named the Sting S3, a ULM version with fixed gear, and even a model with retractable gear known as the Sting RG. Improvements and innovations continue to make the TL 2000 Sting Carbon an industry leader with an excellent safety record due to its performance, ergonomic design, and the outstanding view from the cockpit.

At the two largest airshows of 2007, AERO Friedrichshafen and Airventure Oshkosh, TL introduced its fifth model of aircraft, the TL 3000 Sirius. It is a full composite high wing aircraft that meets ultralight and LSA rules. Early production figures indicate that it has been well accepted in the aviation market and is very good for flight training.

In 2009 TL again led the competition by announcing its latest design creation, the TL 4000. This aircraft is a full featured four seat cruiser intended to revolutionize the extended cross country travel for its owners. With the TL 4000, TL Ultralight aircraft company has now extended its range of products to the entire world aircraft market.

In 2010 TL presented new innovated version of Sting, named the Sting S4. This new model is described in detail in this brochure.


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Sting S4

ULTRALIGHT CZECH REPUBLIC

In April 2010, TL-Ultralight introduced a new generation of the successful type called the Sting S4.

The Sting S4 has been aerodynamically improved with new clean lines not only improving performance but also appearance and the elegant new look is certainly a class leader. Based on the valuable feedback from our customers we have improved the new S4 model to suit your needs!

Pilots are always critical of different aircraft and it was this feedback and observations from our customers that we put into the new Sting S4 aircraft. Little improvements and suggestions were integrated into the new Sting S4.

The Sting S4 is a two seater low-wing aircraft made from carbon fiber, powered by engine mounted in the front, seating is side-by-side. The new Sting S4 improvements and aerodynamic modifications make it more than compatible with the Sting RG model which has retractable landing gear.

The Sting S4 is currently one of the fastest and best-handling czech ultralight aircraft on the market. This sport and cruising aircraft is suitable for all age categories. It ensures excellent enjoyment from flying. Its maximum speed in level flight is around 285 km/h (177 mph, 154 kn). The speed range of the Sting S4 is from the stalling speed 63 km/h (39 mph, 34 kn) up to the never exceed speed 305 km/h (190 mph, 166 kn).

The newly designed Sting S4 grabs you and doesn´t let go. The aircraft turned heads at every airport because of it's like curious design. The most striking feature of the cockpit is the panoramic 360º view. The excellent cabin view as well as the low noise level contribute to the well-being feeling and comfort which is unexpected in this category of aircraft with the sense of freedom being enhanced by a considerable aircraft climb. The cabin consists of a single piece plexiglass canopy which opens upwards and is supported by two piston rods. For the Sting S4 model the cabin has been redesigned with newly offered blue canopy to achieve better appearance. The cockpit is heated for better pilot comfort and new ventilation has been added to the canopy frame to prevent fogging. Other new S4 face lift features include new handles for opening the canopy which provides more comfortable, easier opening and gives better overall impression. For convenient luggage transportation the luggage compartment has been extended to 25 kg load. Primarily we have been focusing on providing better piloting and easy access for pilot and passenger.


2000 Sting S4
Sting S4
Sting S4

How it flies

Remember when flying was fun? Make it so again today. Don't let the high costs of fuel and scheduled maintenance bring your flying down.

The performance envelope of the Sting S4 is responsive, stable and forgiving. The remarkable view from the cockpit, combined with the airplane's agility, power and light control touch, restore the exhilaration of flying and remind you of why you loved it in the first place.

Taxi

The Sting S4 aircraft offers superb visibility in all directions and allows for clear and confident manoeuvring in the taxi area. Taxi speed should be low at just above a brisk walk however the aircraft is extremely stable even when doing high-speed taxis. Even at idle power the aircraft will roll and accelerate so throttle is not often required to taxi the aircraft once it is actually rolling. There is no excuse for allowing your aircraft to wander off the centerline. The toe operated hydraulic disk brakes are extremely strong and positive and at taxi speeds the aircraft will be brought to a halt in only a few metres.

Finding an area free from any stones or other runway debris it is necessary to warm the engine temperatures up before checking the ignition. It is recommended to reach 50°C on the oil gauge before doing the ignition checks. Run the power up to 4000 RPM and quickly switch off and back on each ignition switch, the power drop should be barely noticeable. Immediately after doing the ignition checks reduce the power back to idle. Don't spend a long time at high power settings doing ignition checks because in hot temperatures it may be possible to overheat your engine.

Complete your pre-take-off checks and confirm that the canopy is securely fastened, the seat belts are properly fastened, you have sufficient fuel for the flight and the safety pin has been removed from the ballistic parachute (if fitted). You are now ready to enter the runway.

Take off

Checking that the runway is clear and no aircraft are on approach make your departure radio calls and taxi to align with the centerline of the runway. Check for any cross wind components and position your electric flaps to 15° (take off setting), if fitted with a variable pitch propeller make sure you are in fine pitch or in the climb setting. Do a last visual check of all instruments and slowly advance to full power keeping the aircraft aligned with the runway, ensuring that the tacho RPM remains below 5600 rpm and that the engine is performing as it should. Ground roll on the Sting S4 aircraft is surprisingly short and once the aircraft reaches an indicated speed of 74 km/h (46 mph, 40 kn) slowly pull back on the stick to lift weight of the nose wheel. At around 93 km/h (58 mph, 50 kn) the aircraft will actually leave the ground by itself, allow the speed to build to around 111 km/h (69 mph, 60 kn) for climb.

Climb

The best climb speed is an extremely steep angle which can limit your vision over the nose, it is recommended that passing 100 feet the flaps are retracted to the zero setting and the nose slightly lowered to give a cruise climb between 130 km/h (81 mph, 70 kn) and 148 km/h (92 mph, 80 kn) for good visual clearance in all directions. Even at this speed the Sting's climb rate should be around 1000 feet per minute. Keep a check on your temperature gauges and a visual scan for other traffic.

Cruise

Level off and allow the plane to accelerate to cruise speed, if fitted with a variable pitch or constant speed propeller adjust the settings to suit. It will take approximately 60 seconds for the aircraft to come out of its climb configuration and to accelerate into cruise configuration. The Sting S4 aircraft with its laminar flow wing has a step phenomenon which can be used to great advantage to give the aircraft a high cruising speed. It is recommended to climb slightly higher than your desired cruising altitude and slowly descend back down to the desired level while making any adjustments necessary on the propeller and to trim the aircraft. The aircraft will respond with an increase in speed which can then be maintained for the duration of the flight. It is recommended to use this method of getting on the step to get the best performance from your aircraft. If you level off at your desired altitude and try to get on the step using throttle alone it will take a few minutes to actually build up the required speed to stay there, it is much easier to fly higher then descend using gravity and momentum to assist you on to the step.

Descent

Because the Sting S4 is a fast aircraft your approach to the airport needs to be planned ahead of arrival. Even with the engine running at idle and the aircraft descending at around 500 feet per minute you will still have more than 185 km/h (115 mph, 100 kn) on the airspeed indicator. The best method is to actually slow the aircraft ahead of time by reducing power and slightly pulling the nose up to reduce speed, if fitted with a constant speed or in-flight adjustable propeller now is the time to go back to fine pitch. Once you have your speed under control at around 167 km/h (104 mph, 90kn) it is easy to maintain this speed throughout the circuit pattern. On downwind reduce your power to idle and hold your altitude to allow the airspeed to decay to around 139 km/h (86 mph, 75 kn). Complete your pre-landing checklist and once turned base with an air speed of around 111 km/h (69 mph, 60 kn) engage first stage of flap 15°. Using back trim the aircraft can usually be configured with the engine at idle and one stage of flap to descend at around 450 feet per minute with no stick pressure. The aircraft is extremely controllable in this configuration and it is extremely easy to land, it is recommended that only one stage of flap is required for a normal landing. Should you require short field performance it is then possible to use second stage of flap to 30° but it is generally not necessary. As the aircraft nears the ground reduce power completely to idle and hold off in ground effect when the aircraft has settled to around 93 km/h (58 mph, 51 kn), just keep holding off until the aircraft gently touches down on the runway with minimal descent speed.

Landing

The Sting S4 aircraft is extremely controllable at typical landing speeds and it is recommended to land on the rear wheels and continue to let the speed decay until gently letting the nose wheel come in contact with the ground at around 65 km/h (41 mph, 35 kn). You have now completed your flight in the Sting S4 aircraft, turn off the runway and taxi to the tie down area. Using only idle power will allow the engine enough time to cool down, run through the parking checklist to complete your flight.

Aero-towing

The Sting S4 is approved for towing gliders, in compliance with Q amendment of L2 regulation (Czech rep.) and LFT – UL regulation (Germany).

During aero-towing flight tests with various types of gliders, the Sting S4 demonstrated excellent towing performance. For example, the take-off distance over a 15 m tall obstruction while towing a two-seat glider of 650 kg is within 550 m. The Sting S4 towing a single-seat glider of 300 kg attains a climb speed of 3,5 m/s. With a two-seater glider of 650 kg, the climb speed is up to 2,2 m/s.

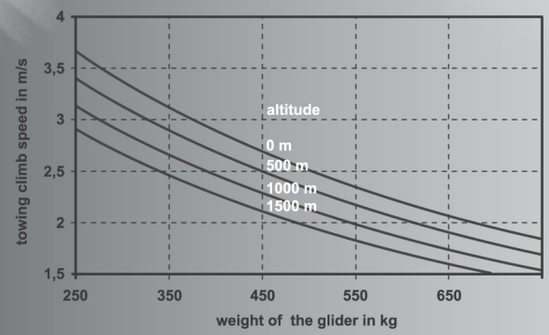
High performance, combined with low noise level (58 dB(A)), low fuel consumption and easy piloting, make the Sting S4 the perfect aircraft for aero-towing.

CERTIFIED OPTIONS OF TOWING STING S4:

option	engine	propeller
1	Rotax 912 ULS	Wezel Flugzeugtechnik MW 180 3BL R
2	Rotax 912 ULS	Alisport AIV 2 - HS
3	Rotax 912 UL	Wezel Flugzeugtechnik MW 180 3BL R

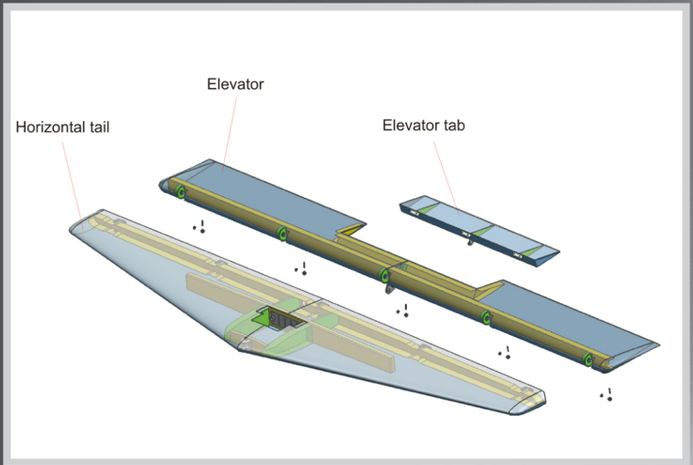
*Other equipment must comply with valid regulation requirements.

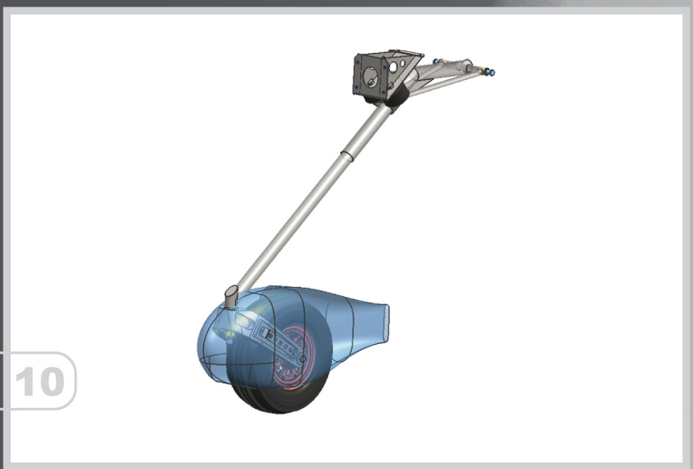
AEROTOWING CLIMB SPEED:

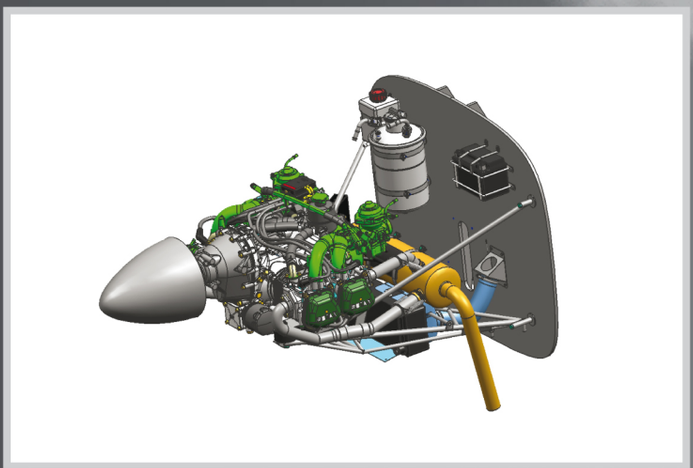


AEROTOWING TECHNICAL DATA:

Maximum strength of towing rope weak link.....300 daN +/- 30 daN
Maximum take-off weight of glider .....720 kg
Optimal climb speed.....110 – 120 km/h
Maximum towing speed.....160 km/h







Construction / Design

The Sting S4 has a fully tapered wing, fixed horizontal and vertical stabilizers, split flaps and powerful elevator, rudder and aileron surfaces. Conformal cowling follows the engine contours, directing cooling air precisely to the areas where it is needed. This permits the use of smaller air inlets, presents less frontal and wetted area and reduces drag. The aerodynamic shape of the Sting S4 makes it agile in flight and gives it an impressive 12:1 glide ratio.

Construction

The Sting S4 is built with composite-reinforced epoxy structures. For weight-savings and superior strength, carbon fiber products comprise approximately 85% of the reinforcing materials. The wing surfaces and fuselage are made from carbon/epoxy sandwich construction cored with closed-cell foam and assembled with epoxy adhesives. Wing and fuselage skins are vacuum bagged and oven cured. Wing spar caps and other heavily loaded components are autoclaved.

High-quality molds and care in layup yield a sleek, paintable exterior surface without the need for gel coat, saving 23 kg of non-structural dead weight. Wings, fuselage and empennage are finished in white, two-part epoxy paint. Colorful graphics are available in vinyl, applied over the painted finish.

Passenger and pilot are enclosed in the carbon-fiber-reinforced cockpit cage with integral rollover protection.

From 2010 year the company is equipped with water jet cutting and other CNC machinery to improve the quality and to speed up the serial production. These machines allow to proceed quickly any new modifications due to the fast and precise model manufacturing.

Design

The design of the Sting S4 is a product of TL-ULTRALIGHT design team, some work done in collaboration with Czech Technical University of Prague, specializes in the design, analysis and testing of whole-composite aircraft and aircraft components. The Sting S4 has aerodynamic clean lines, low-wing, tricycle-geared, single-engine airplane manufactured from composite materials. The wing of the Sting S4 uses the MS (1)-0313 airfoil profile and is tapered.


2000 Sting S4
Sting S4
2000 Sting S4


Sting S4

Sting S4

The next generation brings new possibilities

1/

Engine ROTAX

engine type	performance			torque			max. RPM
	kW	hp	1/min	Nm	t. b	1/min	1/min
912 UL	59,6	80	5800	103	75,9	4800	5800
912 ULS	73,5	100	5800	128	94	5100	5800
914 UL	84,5	115	5800	144	106	4900	5800

2/

1/ ROTAX 912UL, 912ULS

The Rotax 912 series engine is 4-cylinder, 4-stroke, liquid/air cooled engine with horizontally dry sump with forced lubrication and separate oil tank, opposed cylinders, dry sump with forced lubrication and separate oil tank, automatic hydraulic adjustment of the valve tappets, 2 carburetors, mechanical fuel pump, dual electronic ignition, electric starter, propeller speed reduction unit (gearbox), engine mount assembly, air intake system, stainless steel exhaust system and are available in either 80hp or 100hp version.

2/ ROTAX 914

The Rotax 914 turbo charged engine with automatic waste gate control is 4-cylinder, 4-stroke, liquid/air cooled engine with horizontally opposed cylinders, dry sump with forced lubrication and separate oil tank, automatic hydraulic adjustment of the valve tappets, 2 carburetors, mechanical fuel pump, dual electronic ignition, electric starter, propeller speed reduction unit (gearbox), engine mount assembly, air intake system, stainless steel exhaust system and produces 115hp.

Propeller DUC

Thanks to the « constant speed » effect, the propeller DUC swirl has very little variation of the RPM engine between static and dynamic.

This propeller makes it possible to have more performances on the whole of flight to knowing:

> Better effectiveness on the take-off and in climbs due to the raised engine speed
> Easy maintenance
> High reliability
> Aeroelastic carbon blades
> High quality carbon hub
> A great comfort of use

The INCONEL SWIRL Blade is protected on the leading edge with an Inconel reinforcement made of stainless steel with a very high hardness of surface.

Cockpit

The Sting's S4 ergonomic cockpit layout promotes proficient flying. Flight controls are strategically placed for ease of access. The layout of the instrument panel facilitates a quick and easy scan.

The most striking feature of the cockpit is the panoramic 360º view afforded by the optically blue or tinted canopy. Molded, semi-reclined seats provide lumbar support for pilot and passenger. Dual sticks with PTT and adjustable rudder pedals are provided left and right. The inside of the cabin is lined with high quality carpet and map pockets are provided on both sides. Four point harnesses are standard, as is fresh-air-sourced cabin heat and effective ventilation. The low noise cockpit is well organized and comfortably appointed for hours of flying fun.

Safety

The whole-plane ballistic parachute system looks very similar to other available products, but on closer inspection there are obvious differences in operation which make the GRS a superior unit. While it is unlikely that you will ever use the GRS in an aircraft, it is comforting to have a parachute system for an unexpected dramatic event.

The GRS is a new design in which the canopy is not gradually drawn from a box by means of a long conventional sleeve, distorted by air currents and possibly fouling on the aircraft structure or its debris, during deployment. The GRS canopy is drawn away from the aircraft in a short special compact container to a distance of 9 meters. At this point the whole hanging system from canopy to aircraft is stretched, a container lock is released and the canopy is inflated directly, significantly reducing the risk of debris damaging the canopy. The GRS is designed and constructed for the fastest possible opening, which enhances the potential of a rescue of the aircraft and crew from the lowest possible height.

Firing the system is done mechanically, by hand pulling the activation handle with a force of approximately 9 kg. Launching ignition mechanism is activated and two igniters will be fired by double strikers, which will ignite the powder load and ignite the solid fuel of the rocket engine. During firing there is minimum rearward impact. Unlike other similar systems, the flame from the rocket tube is not directed back in the trajectory of the rocket, which can cause powerful backfire into an aircraft construction. After canopy opening above the aircraft at height of around 20 meters the rocket engine continues its own flight with its remaining energy and separates from the main canopy. It then free falls with its own braking inner chute. The main canopy system is opened and fully inflated above the aircraft within seconds after being fired. This means that a rescue can be successful from as little as 30 to 150 meters above the ground, depending on the position of the aircraft, its speed and trajectory.


SUPACE
Sting
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Sting
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SUPACE

Panel board

The Sting S4 is delivered with range of DYNON glass cockpit products or with analogue instruments. Communications and navigations are normally offered with the Garmin sport stack made in USA or ICOM system made in Japan. This panel board is also designed for night flying and can be equipped with IFR instruments. Bellow you may find some specific information.

SKYVIEW D1000

The latest generation glass cockpit called the Skyview D1000 is completely automated system including EFIS and EMS. The SkyView System is designed to have an integrated GPS Moving Map and transponder S. SkyView Displays are very bright, high-resolution screens driven by advanced graphics processors create highly visible and readable display. Even in direct sunlight. The SkyView System is designed for ease of use while flying. The most used functions are accessed via two rotary/multi-direction joysticks, for fast intuitive commands. Almost all other in flight commands, using the widely spaced buttons, are only two button presses away. None or more than three button presses. Skyview is provided with flash disc that allows the owner to download the latest systems and applications to stay up to date. This system is equipped with backup battery in case of electric failure.

SKYVIEW AUTOPILOT

Every Dynon autopilot can fly magnetic heading, GPS ground track, and horizontal NAV from any connected compatible radio or GPS. In addition to being able to hold altitude, the autopilot can fly to a new altitude and level off once it arrives. Additional standard features include emergency 180-degree turn capability, control wheel steering, and standard trim sensing and annunciation on all servos used on the pitch axis. And because Dynon's autopilot is built on its best-selling EFIS systems, it can respect bank angle, airspeed, and G limitations too.


ALL AEROBATIC MANEUVERS
INCLUDING SPINS
PROHIBITED
OK - PUA 69
DYNON AVIONICS
OFF R L BOTH START
ACS
STARTER
MAIN
INSTR
STRB
NAV
LAND
AUXP

Vinyl graphic designs

ULTRALIGHT CZECH REPUBLIC


R1.1


R1.2


R2.1


R2.2


R3.1


R3.2


R4.1


R4.2


R5.1


R5.2


R6.1


R6.2


R7.1


R10.1


J5.1


R7.2


R10.2


J6.1


R8.1


J1.1


J7.1


R8.2


J2.1


J8.1


R9.1


J3.1


J9.1


R9.2


J4.1


J10.1

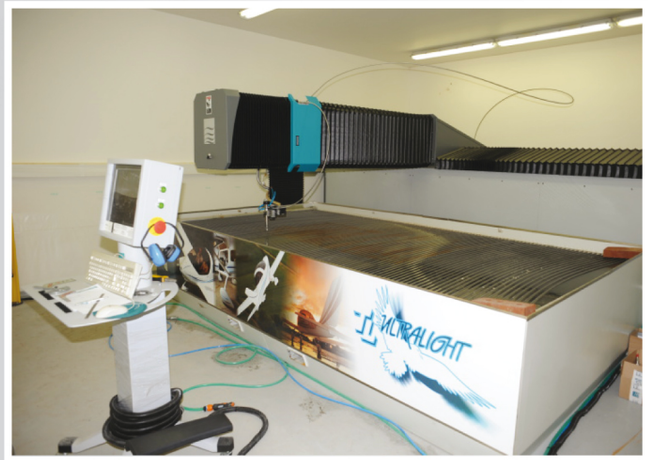
Production / Service

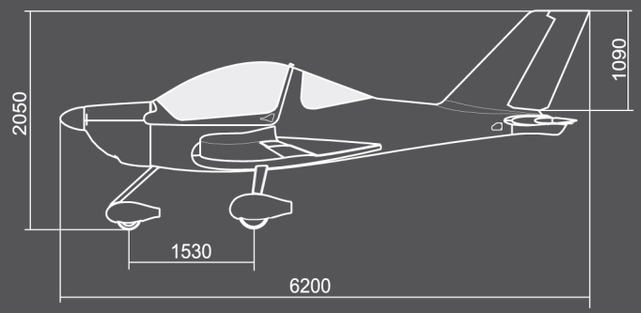
The TL-Ultralight aircraft company is located in its own buildings, offices and hangars at Hradec Kralove airport in the Czech Republic. Within these self contained facilities the entire design, production, testing and quality control of all aircraft are carried out.

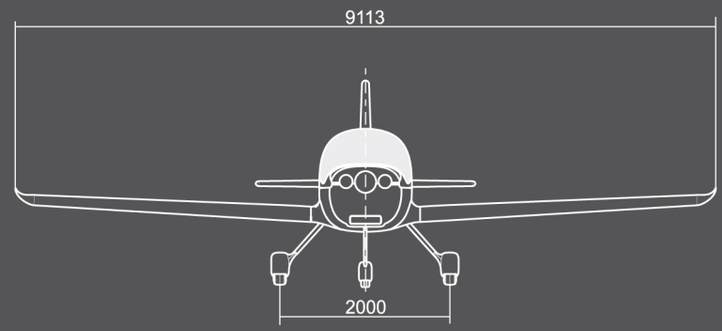
An average production rate of 9 to 10 aircraft per month leaves final assembly line for the TL flight testing hangar. Repairs and services are provided for all previously completed aircraft. The staff consists of more than hundred employees focused on production. An additional team of more than ten employees care for sales, material supply, production management and quality control. At the Hradec Kralove airport all test flights, demonstration flights, training, warranty and after warranty repairs are done by highly qualified aircraft engineers.

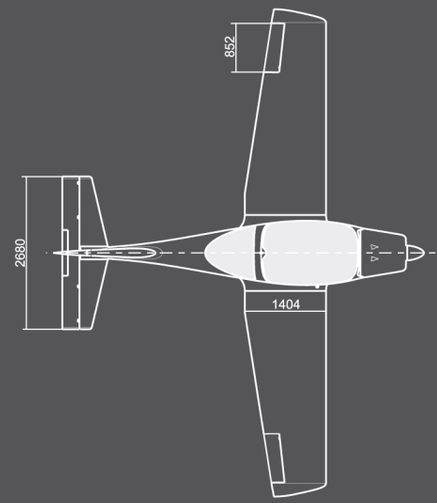
The TL production and quality control allow to track and backtrail any production stage of an aircraft and is a sophisticated logistics system which complies with the ASTM standards. Beyond this, each and every aircraft is personally test flown by the owner, Mr. Jiri Tlusty.

Aircraft shipped overseas are being packed and loaded into containers to over thirty dealers who distribute TL products. Currently aircraft are delivered to the United States, the European Union, and other countries in the world.









TECHNICAL DATA

Length	6,2 m
Total height	2,05 m
Wing span	9,11 m
Wing area	10,52 m²
Horizontal fin span	2,68 m
Horizontal fin area	1,68 m²
Vertical fin area	1,06 m²
Cabin width	1,1 m
Minimum speed	62 km/h
Maximum speed	270 km/h
Cruising speed	230-270 km/h
Never exceed speed	305 km/h
Climb rate	8 m/s
Empty weight (according to type)	297 kg
Max. take-off weight	472,5 kg (600 kg LSA)
Max. crew weight	185 kg
Min. crew weight	70 kg
Max. luggage weight	8 kg
Fuel consumption	8-12 l/h
Fuel tank capacity	77 l
Flying range	1500 km

*right to make changes reserved

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GPS: 50°14'33, 59 N / 15°50'34, 89 E

see our dealer list on WWW.TL-ULTRALIGHT.CZ

many years we fly all around the world

Typhoon Condor Star Sting Sirius

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