ULTRALIGHT

CZECH REPUBLIC

Sting

ideal for pilot training, leisure flying and business trips

ULTRALIGHT CZECH REPUBLIC

OUR HISTORY

The TL Ultralight aircraft company was established over 20 years ago in 1989. The company owner, Mr. Jiri Tlusty, designed the first production products which were engine powered hangliders. Motorized trikes were successfully added to the product line but Mr.Tlusty had plans for an even bigger step.

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 Typhoon became so successful it has become a legend in the Czech light aircraft history of flight. Its popularity pushed production to over 200 aircraft.

Within four years of company operation another new design was introduced to the aviation press. With Tlusty's leadership, TL began production of an affordable metal high wing aircraft titled 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, Tlusty brought to the market a completely new concept, the TL 96 Star. A very modern design, the Star was a low wing, full composite aircraft which set both performance and market class records.

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 of the Star detailing, the TL design team added a new high performance wing, an anti-servo elevator and a low drag conforming engine cowling. Thanks to total effect of these design innovations there was a new member of TL family, named the TL 2000 Sting Carbon. This exciting aircraft is manufactured in serial production as several variants, a Light Sport (LSA) named the StingS3, a ULM version with fixed gear, and even a model with retractable gear known as the Sting RG. Improvements and innovations continue to make this TL aircraft an industry leader with an excellent safety record due to its performance, ergonometric 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 production aircraft, the TL 3000. It is a full composite high wing aircraft that meets LSA rules as well. Early production figures indicate that it has been well accepted in the aviation market and is very good aircraft 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 of its owners. With the TL 4000, TL-ULTRALIGHT aircraft has now extended its range of products to the entire world aircraft market.

Sting

TL 2000 Sting carbon is the aircraft of the highest quality

- large two seat quiet 360º view cockpit
- all carbon fibre construction
- safe and smooth controls
- amazing rate of climb and speed range
- excelent gliding capabilities
- optional retractible undercarrige, electric flaps, aero towing

A responsive airplane with thoughtful safety features, the TL 2000 Sting carbon appeals to seasoned pilots who want to put aside the costs of ordinary aircraft ownership and regain the pure joy of flying.

The TL 2000 Sting carbon offers a ground breaking optional in flight adjustable propeller which is electronically controlled needing no pilot input. Sting can be fitted with ground adjustible propeller with flexible carbon blades as well which gives the aircraft very similar performance. The elegant and perfectly aerodynamically shaped TL 2000 Sting was designed to achieve the highest speed of flight. The Sting really is the fastest ultralight and its maximum speed in horizontal flight of 280 km/h is not definitely the last word. It has a wide available speed of flight 63km/ - 305km/h which gives pilots of all abilities the opportunity to operate within their skill levels and to fly from short grass strips or tarmac. In a pilot´s hands the Sting is a dynamic machine with the characteristics and comfort and style as yet unattainable.

The Sting two seat, side by side cabin is very roomy even for the fuller figure. Sitting in the full-featured cockpit, you'll enjoy the 360º view, the low noise level and the ergonomic arrangement of panel and controls. The aircraft is fitted with double steering and standard nose wheel configuration with the two main wheels being hydraulic disk braked and durable nose wheel, optionally can be fitted with electric retractible undercarriage to reach higher speed. The aircraft is fitted with very effective mechanical flaps in standard to aid short field landing and take off, optionally the electric flaps may be installed. The Sting was the first to incorporate advanced safety measures in airframe, engine, visibility, maneuverability, situational awareness and crew protection that are essential components of the fun of flying.


Sting carbon
2000 Sting carbon
OK-MUA 85

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 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 TL 2000 Sting Carbon 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. The nose wheel is directly connected to the rudder pedals and as such offers perfect control and stability on the ground, 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. I recommend 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 done up, 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 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 TL 2000 Sting Carbon aircraft is surprisingly short and once the aircraft reaches an indicated speed of 74 km/h slowly pull back on the stick to lift weight of the nose wheel. At around 93 km/h the aircraft will actually leave the ground by itself, allow the speed to build to around 111 km/h for climb.

Climb

The best climb speed is an extremely steep angle which can limit your vision over the nose, it is our recommendation 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 and 148 km/h 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 TL 2000 Sting Carbon 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 our recommendation 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 our recommendation 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 TL 2000 Sting Carbon 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 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 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. Complete your pre-landing checklist and once turned base with an air speed of around 111 km/h 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 our recommendation 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, just keep holding off until the aircraft gently touches down on the runway with minimal descent speed.

Landing

The TL 2000 Sting Carbon aircraft is extremely controllable at typical landing speeds and is our recommendation 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.

You have now completed your flight in the TL 2000 Sting Carbon 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.

RETRACTIBLE UNDERCARRIAGE

TL 2000 Sting carbon can be equipped with retractible undercarriage in order to reach higher speed.

- the system is electronically operated by two electric servo engines
- the nose gear fully retracted, main wheels partly closed
- the emergancy openning supplied in case of electric failure
- the amazing rate of climb 5 km/h higher than fixed undercarriage
- the excelent cruising speed 10 km/h higher than fixed undercarriage
- the best maximum speed 25 km/h higher than fixed undercarriage which gives us 305 km/h


Stiny
OK-MUA 93

AERO-TOWING

The TL–2000 Sting 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 TL-2000 Sting 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 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.

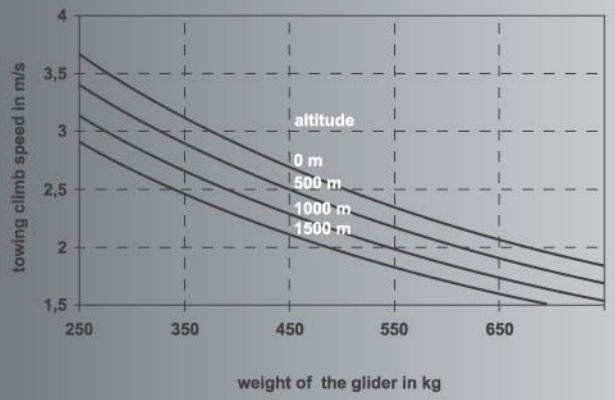
High performance, combined with low noise level (58 dB(A)), low fuel consumption and easy piloting, make the TL-2000 Sting the perfect aircraft for aero-towing.

CERTIFIED OPTIONS OF TOWING TL – 2000 STING:

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 equippment 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

EXPEDITION ROUND EUROPE

TL-ULTRAlight has participated on europian expedition in 2006 year. Specialy made aircraft fitted with camera system was furnished to whole adventure team of photographers, pilots and reporters. Below are interesting numbers that describes the expedition flight.

Chief pilot Patric Sainer and his team visited 23 countries in total. Total air time included plane preparation at CZ was 210 flight hours according by hobbs meter. Total flown distance was approximately 25 000 km. TL 2000 Sting consumed about 3360 litres of gasoline during the flight - the most often Avgas 100 LL. He landen 140 times during expedition flight at about 88 airports, airfields or microlight fields. The longest flight time at one day was 7 hours 45 minutes. He flown through the three time zones at all. The longest flight over the sea was from Sardinia to Malta - it was 610 kilometres. He took more than 30 000 pictures during flight at space about 80 GB. More photots are available at www.roundeu.cz.

Overflown countries:

Czech Republic; Germany; France; Spain; Portugal; Italy; Malta; Greece; Slovenia; Hungary; Slovakia; Austria; Luxembourg; Belgium; United Kingdom; Ireland; The Netherlands; Denmark; Sweden; Norway; Finland; Estonia; Latvia; Lithuania; Poland

www.roundeu.cz


CZECH REPUBLIC
DATABÁZE LETIŠŤ
PROTOOL
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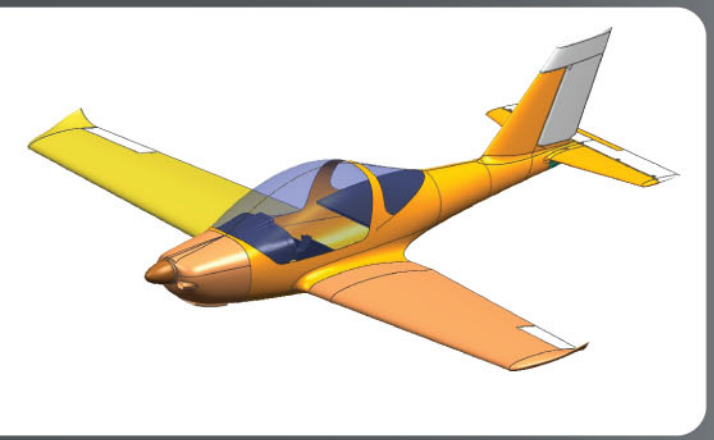
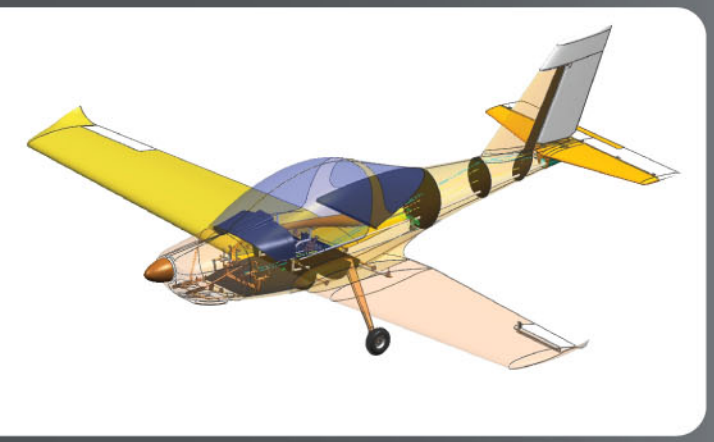
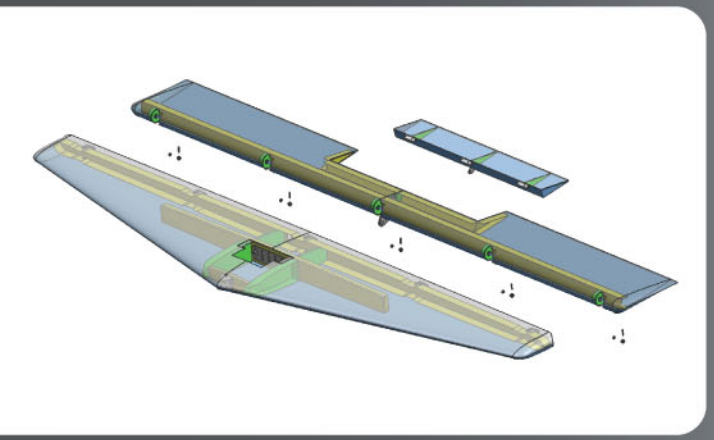
TLULTRALIGHT LONG DISTANCE FLIGHT EXPEDITION 2006


ULTRALIGHT
Sting







CONSTRUCTION / DESIGN

TL 2000 Sting 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 makes it agile in flight and gives it an impressive 12:1 glide ratio.

Constraction

The Sting 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.

Design

The design of the Sting 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 is an aerodynamically clean, low-wing, tricycle-geared, single-engine airplane manufactured from composite materials with two side-by-side seats. The wing of the Sting uses the MS (1)-0313 airfoil profile and it is tapered.


OK-MUA85
2000 Sting
2000 Sting

1/

2/

ENGINE ROTAX

1.500 hrs. TBO ROTAX AIRCRAFT ENGINES

IN COMPLIANCE WITH ASTM 2339-04 LSA AIRCRAFT ENGINE ROTAX AIRCRAFT ENGINES

STATE OF THE ART ROTAX WORLD STANDARD

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

1/ ROTAX 912UL, 912 ULS

4-cylinder, 4-stroke liquid/air cooled engine with opposed cylinders, dry sump forced lubrication with seperate oil tank, automatic adjustment by hydraulic valve tappet, 2 carburators, mechanical fuel pump, dual electronic ignition, electric starter, propeller speed reduction unit, engine mount assembly, air intake system, exhaust system

2/ ROTAX 914

4-cylinder, 4-stroke liquid/air cooled engine with opposed cylinders, with turbo changer, with automatic waste gate control, dry sump forced lubrication with separate oil tank, automatic adjustment by hydraulic valve tappet, 2 carburators, dual electronic ignition, electric starter, propeller speed reduction unit, engine mount assembly, air intake system, exhaust system


N6655
Sting Sport
Sting Sport

COCPIT

The Sting's 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 clear 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.

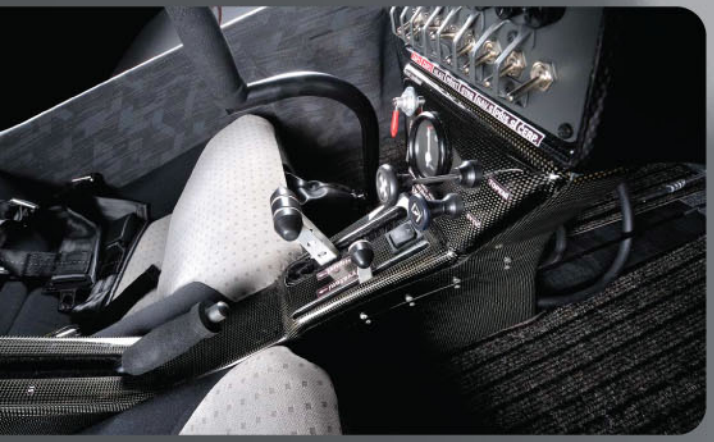
SAFETY

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 openning, which enhances the potential of a rescue of the aircraft and crew from the lowest possible height.

Firing the system is done mechanicly, 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 open 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.


OK-MUA 85



PANEL BOARD

TL 2000 Sting is delivered with an electronic flight instrumentation system by ATECH company, Italy or Dynon Avionics, and with the Garmin sport stack of GPS and communications avionics made in USA, or radio ICOM made in Japan. Below you may find some specific detailed information.

AV 3000 integrates, in a completely automated system, both an EMS and EFIS that offer solid-state reliability and a transflective, colour 8.5"LCD, sunlight readable monitor. AV 3000 represents a new generation of digital instruments with either analogic and graphic reading. Its class-leading display affords screen partitioning, by showing, simultaneously, 7 primary flight instruments, and 10degree parameters, in a simple and immediate graphic form. EFIS consists in an Inertial Navigation System coupled with GPS system, where the Inertial Navigation Platform is the core component for providing accelerations, speeds, rotations and displacement in the space data, and it is served by a GPS, which provides a reference position calculation as often as possible, depending on the satellite signals availability, at its highest frequency of 1Hz. AV3000 is able to provide all dynamic data for performance and navigational aid and planning, and is coupled with an air data computer for checking all parameters relative to altitude, speed etc. It is basically settled for rotax engines.

AV 3000 made by ATECH

Green Line Sting

Another popular panel choice is called the GreenLine™ EMS engine monitoring system, manufactured exclusively for Sting aircraft by I-K Technologies, USA. The GreenLine EMS displays critical engine parameters at a single glance, with obvious alerts for out-of-limit conditions and digital details when needed and a remote alert light mounted in front of the pilot.


STARTER
PALIVO ZAVŘENO
AKROBACIE
ZAKÁZÁNY

DESIGN

R1.1

R3.1

R4.1

R1.2

R3.2

R5.1

R2.1

R3.3

R6.2

R2.2

R4.2

R6.1

R7.1

R10.2

J6.1

R7.2

R11.1

J7.1

R8.1

J1.1

J8.1

R9.3

J3.1

J9.1

R9.4

J4.1

J10.1

R10.1

J5.1

J11.1

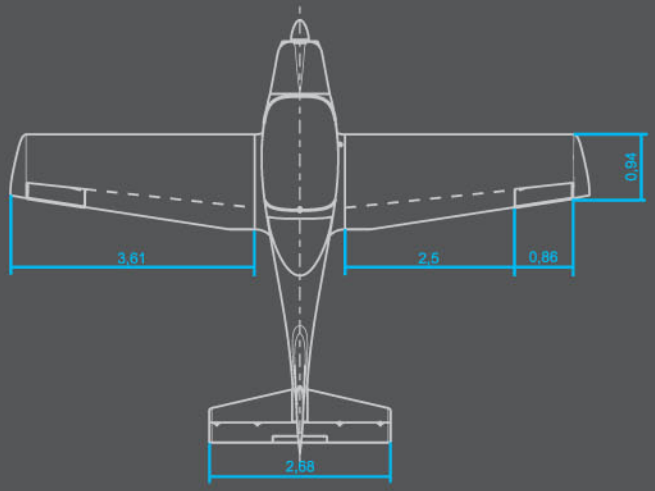
PRODUCTION / SERVICE

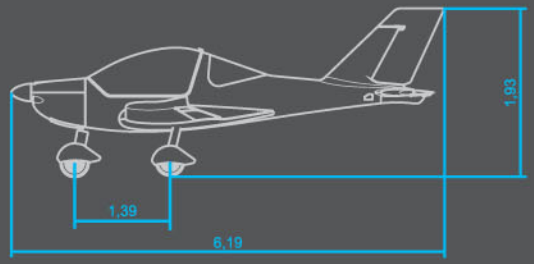
The TL-Ultralight aircraft company is located in its own buildings, offices and hangars at the Hradec Kralove airport in the Czech Republic. Within these self contained facilities the entire design, production, testing and quality control of our aircraft are carried out.

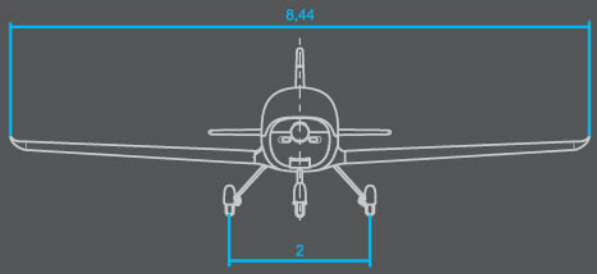
An average production rate of 7 to 8 aircraft per month leaves the final assembly line for the TL flight testing hangar. We also provide repairs and service at the same time for all of our previously completed aircraft. The staff consists of more than ninety employees focused on the production. An additional team of more than ten employees take care for sales, material supply, production management and quality control. At the Hradec Kralove airport all test flights, demonstration flights, training, and warranty and after warranty repairs are done by well qualified mechanics.

The TL production and quality control allows us to track and backtrail any production stage of an aircraft and it is a sophisticated logistics system which complies with the ASTM standards. Furthermore 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.







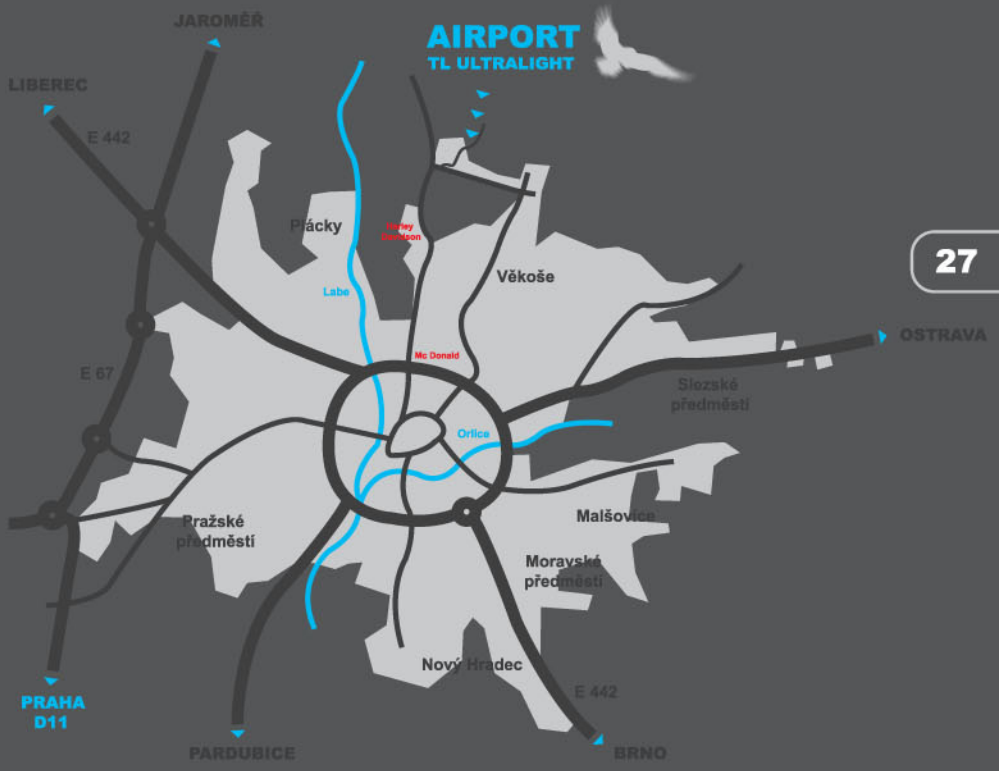
TECHNICAL DATA

Length	6,19 m
Total height	2,10 m
Wing span	8,44 m
Wing area	9,81 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 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	75 l
Flying range	1500 km

*right to make changes reserved

CZ / HRADEC KRALOVE

TL-ULTRALIGHT s.r.o.
Airport, building 84, Hradec Kralove,CZECH REPUBLIC
GPS: 50°14'33, 59 S / 15°50'34, 89 V



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

many years we fly all aroud the world

Typhoon Condor Star Sting Sirius

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