

FLY THE  
**ENERGY**

which is the best way to fly that you know?



## AIRCRAFT BASIC DESCRIPTION

**SHARK** is an all-composite low-wing ultralight airplane with retractable undercarriage and airframe created from carbon and glass-fibre composites, reinforced by foam or aramid honeycomb sandwiches, with tandem seating under the right foldable canopy, designed for faster cross-country flights.

The aircraft is equipped with 100HP Rotax 912 ULS engine (80HP Rotax 912 UL as an option for **SHARK** UL model) and Woodcomp SR 3000 B 2-blade in flight adjustable propeller (other propeller are optional – see Supplement 2)

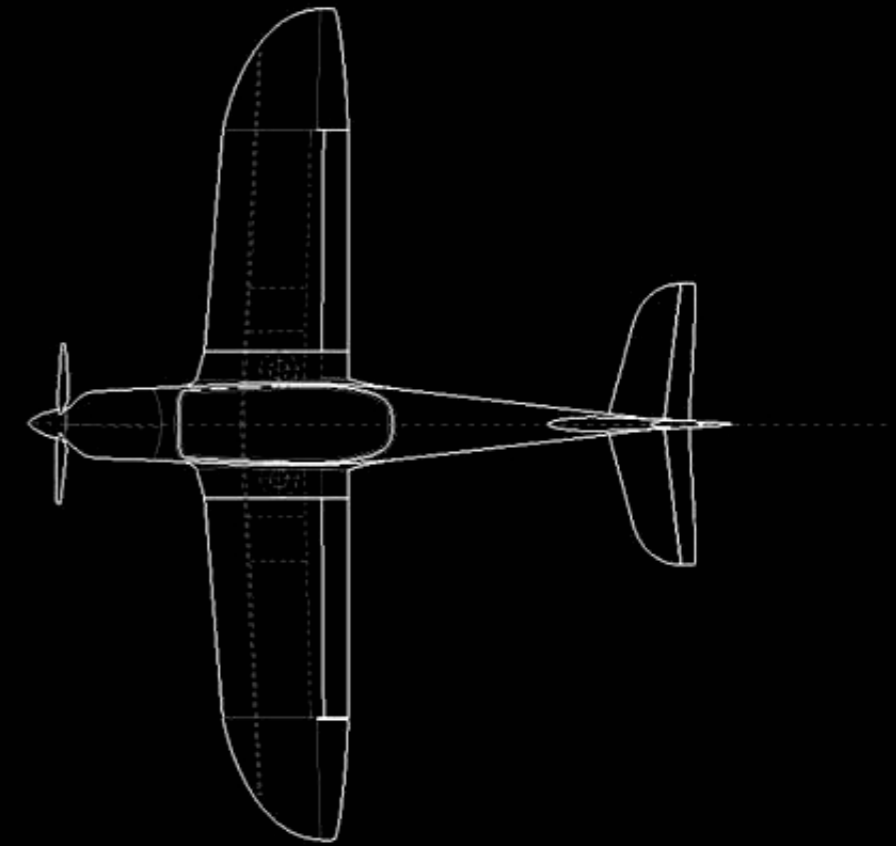
<b>Wing span</b>	<b>7,9 m</b>
<b>Length</b>	<b>6,7 m</b>
<b>Height</b>	<b>2,3 m</b>
<b>Wing area</b>	<b>9,5 m<sup>2</sup></b>
<b>MAC length</b>	<b>1,237 m</b>
<b>swept wing angles</b>	<b>3,53° / 13,8° / 39,8°</b>

Existing aircraft versions, approved by calculations and proofs covers installations of engines Rotax 912ULS (standard), Rotax 912 UL, Rotax 914, using of fixed gear (LS), and has a lot of options.

All versions are calculated and tested for MTOW 600kg, but specific Flight manual has defined limits, valid for category in the specific region of the World – in Czech Republic according to maximal limits of using under LAA.



## THREE VIEW DRAWING



## AIRCRAFT AND SYSTEM DESCRIPTION

Composite high-performance low-wing with classic tail and tandem seating, designed according to European UL and US Light Sport Aircraft criteria.

Aircraft is powered by 75 kW/100HP Rotax 912ULS flat-four engine with variable-pitch composite propeller. 100 litres Integral fuel tanks in wings.

Standard **SHARK** version has tricycle type retractable undercarriage with steerable nose wheel and main wheels with hydraulic disc brakes.

**SHARKLS** with fixed undercarriage has composite main, and simplified front leg.

**SHARK**'s completely upholstered two-seat tandem cockpit with adjustable seats has full dual controls – with sidesticks on the right and throttles and flap levers on the left panels.

Elevator trim tab is controlled by electric switch on the sidestick.

Instrument panels with EFIS/EMS displays for both pilots are complete with the transceiver, transponder and GPS and secondary analog indicators.

The single-piece cockpit canopy opens to starboard and is supported by gas struts.

Great baggage compartment is located aft of seats, accessible from the rear pilot place, and mainly through great lockable baggage door, from left (port) side of the ground.

## AIRFRAME

Glass-fibre and carbonfibre/epoxy airframe, with PVC foam and aramid honeycomb core in sandwich panels.

## FUSELAGE

Monocoque fuselage from carbonfibre and glass-fibre /epoxy composites with integral fin and integrated arm rests, seat backs, floors and instrument panels, created together one strength structure.

Glass-fibre is used for fin, because antennas are mounted inside of the fin structure.

A part of fuselage airframe is short, 1,73m center-wing, used for main undercarriage retracting and cockpit entry.

Fuselage airframe includes all needed hinges and reinforcing for firewall with four engine mounting hinges, structure and hinges of front undercarriage and GRS in the front, wing, main undercarriage and cockpit hinges in the middle, and frames with 2+1 hinges of horizontal stabiliser and 2 hinges of rudder in the rear part, together with bottom fin with tailbump, prepared for optional towing system.

## COCKPIT CANOPY

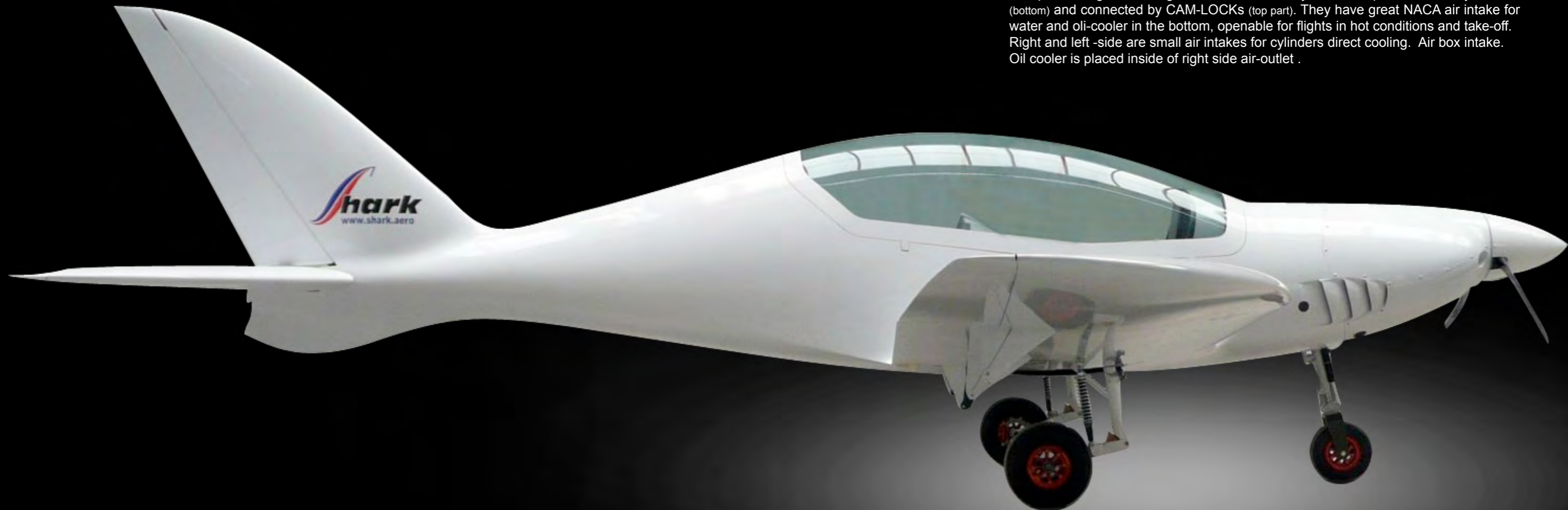
One-piece cockpit canopy frame from carbon fiber has glued plexiglas windscreen. Canopy is hinged on the right side (starboard) in two hinges and locked in 2 points on the left side, by locks controllable from inside.

Canopy is equipped by classic outside handle in the rear corner, with key lock, the same for baggage compartment – and key switch.

In the cross frame, there is placed gas-spring, helping to open and close.

## ENGINE COWLINGS

Composite engine cowlings with natural aerodynamic shape are fixed by screws (bottom) and connected by CAM-LOCKS (top part). They have great NACA air intake for water and oil-cooler in the bottom, openable for flights in hot conditions and take-off. Right and left -side are small air intakes for cylinders direct cooling. Air box intake. Oil cooler is placed inside of right side air-outlet .



## WING

Trapeze composite wing with own special “speedy” airfoil and elliptic leading edge in aileron - part of wing is optimized for fast cross-country flights.

Wing structure is carbonfibre/epoxy monocoque, with PVC foam panels .

Carbon-fibre main spar in 25% of airfoil and an auxiliary spar carrying flap levers and aileron hinges has 60% of the trailing edge occupied by powerful singleslotted flaps.

Wings can be quickly detached for transportation or storage

– after dismounting of two main beam bolts and rear one bolt of rear beam brackets.

100 liters (2x50) integral fuel tanks are between main and rear beams of both wings

– with connections of fuel gauges, lines, caps and drain valves.

Fuel tank vent is finished by last flaps levers.

## AILERONS

40% differential ailerons of carbon monocoque structure are hinged in three hinges under top wing surface. Aerodynamic nose of aileron ends are leveling control forces

– and in the same time are used for weight ballancing.

## FLAPS

Fowler flaps are monocoque sandwich design, hinged each in three leverhinges and driven from its root-rib lever. System of electric flaps BETAKOM has deflections 20°

(take-off), 30° (short take off/ landing), and 40° (landing).

## HORIZONTAL STABILIZER

Swept stabilizer of carbon – monocoque sandwich design with continual rear and helping front beams has hinges of elevator under top surface of rear beam.

Stabilizer is fixed to fuselage in two front hinges to the rear fin frame and one to the rear fuselage bracket.

## ELEVATOR

Divided monocoque carbon elevator is hinged to stabilizer in 3 hinges , left one is equipped with electric trim-tab.

## RUDDER

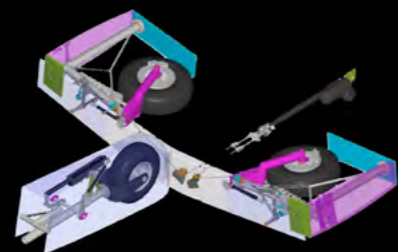
Carbon monocoque rudder is hinged in two hinges and controlled by lever in root rib, through cables in plastic tubes.

## UNDERCARRIAGE

**SHARK** has tricycle type retractable undercarriage with steerable 13x4” nose wheel and 14x4” main wheels Beringer with hydraulic disc brakes.

Front undercarriage is retracted to the rear, main to the center into center-wing boxes.

Fixed undercarriage of **SHARKLS** has composite main legs and simplified front leg.



## COCKPIT - INTERIOR AND INSTRUMENTS

- Access to pilot place through right-side openable canopy controlled by levers with possibility to lock it by key from outside.
- Individual gas-strut height adjustable integral tandem composite seats for two persons in enclosed cabin – with pair of four point safety belts.
- Dual controls with dual sidesticks on the right side , dual adjustable rudder control pedals, connected with front wheel control – and on left panel located throttle and choke handels, handels of water cooler-jaws opening for starts in hot conditions, together with handles of flaps and elevator trim, and with cockpit heating control lever and handel of carburettor heating.
- Hydraulic brakes of main wheels Beringer controlled by the toe-brakes on front pedals, respectively by central lever of rear pilot.
- Three-parts instrument panel 1(instrument panel described in followed chapter) with alternative compass mounting on the top of middle part with air vents on the instrument panel sides.
- Flaps control and undercarriage retracting control are placed on left side of instrument panels, together with switches of position and landing lights.
- Middle panel is used for EFIS, GPS and communication instruments, right side is used to give informations about engine - EMS, - and switches/breakers of main systems
- Trim switch and radio button are placed on the top of sidestick’s grips.
- Fuel vent Amdair 6 is placed on the left armrest in front of throttle grip – with indication of fuel amount in EMS panel including minimum fuel information.
- Behind of rear pilot seat located baggage compartment is accessible from inside or from outside lockable doors for carrying of larger cargo.
- Standardly mounted ballistic rescue system has activated RED grips mounted in the middle of column between both pilot’s legs.



## FRONT INSTRUMENT PANEL



### FLIGHT INSTRUMENTS :

- EFIS Dynon D100 top panel - main
- Airspeed indicator ø60 Winter 8026 - 510° incl. colors secondary - left
- Altimeter ø 60 Winter 4550 3pointers, 20.000 feet secondary - right

### ENGINE INSTRUMENTS /elektro:

- EMS Dynon EMS-D10 right panel
- Brakers / switches Thermal Overcurrent Circuit Breaker E-T-A 1110-F1
- Push starter Honda Civic middle panel -bottom
- Key switch ACS model No. A-510-5K (+ door-locks and locking by 1 key )

### COMMUNICATION :

- Radio Garmin SL30 NAV/COM middle panel
- Transponder GARMIN GTX 328 middle panel
- GPS Garmin 495 middle panel -top

### HANDELS :

- TRIM RAC/ Ray Allen indicator RP3 (LED) + button on the sidesticks
- FLAPs Driver BETAKOM (incl. signalization) - set ow two
- Undercarriage retracting driver **SHARK.aero** (incl. signalization)
- Throttle and choke driver 2 CONTROL LEVER side mount Mechanically connected levers Aircraft Spruce SMCT2L P/N 05-00697
- Fuel vent Andar Fs15x2 – left side on the arm rest near throttle
- Proppeller driver (if inflight adjustable propeller mounted)
- Driver ELT + ELT Ameri-King AK 450
- Front handle of Galaxy rescue system

## REAR INSTRUMENT PANEL



### FLIGHT INSTRUMENTS :

- top panel – crossbar of canopy frame (foldable)
- EFIS / EMS Dynon D100 – is possible to switch between 100 , 120 a 180
- Airspeed indicator ø60 Winter 8026 - 510° incl. colors secondary - left
- Altimeter ø 60 Winter 4550 3pointers, 20.000 feet secondary - right
- Proppeller driver (if inflight adjustable propeller mounted)

### COMMUNICATION /elektro:

- fixed middle panel, rear to front pilot back
- Radio - rack for remounting from front place to rear pilot – if solo flying from rear
- FLAPs driver BETAKOM (incl. signalization)
- Undercarriage retracting driver **SHARK.aero** (incl. signalization)
- Push starter Honda Civic middle panel -bottom
- Key switch ACS model No. A-510-5K (+ door-locks and locking by 1 key )
- Brakers / switches Thermal Overcurrent Circuit Breaker E-T-A 1110-F1
- Rear handle of Galaxy rescue system
- Switch MASTER/SLAVE lockable together with handle of BRS

## PROPELLER BLADES — CONSTRUCTIONAL DESIGN:

### WOOD - CARBON (BLACK) BLADES with plastic leading edge

For propeller blades with wooden core and carbon fibre surface, the leading edges of the blades are cast from highly resistant plastic material, that serves as protection against impacting sand, small stones, water and other effects, which may damage propeller blades.



### REVERSE regime

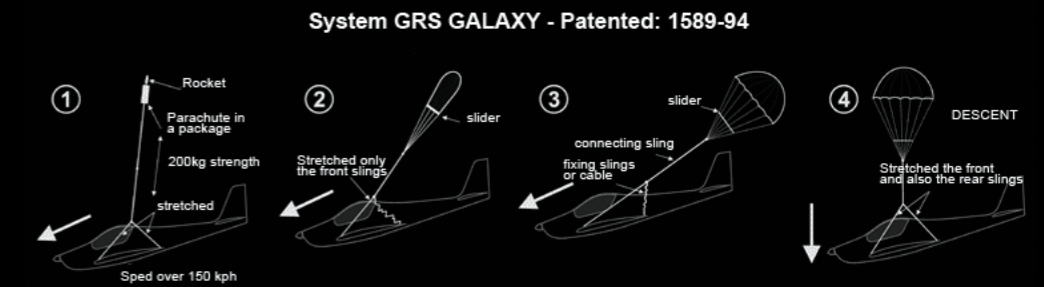
As an option, an additional device may be installed in the cockpit which allows selection of negative propeller pitch settings and thus REVERSE thrust. This allows additional braking or backwards motion on the ground.

### FEATHERING regime

Optionally, the propeller can be equipped with feathering function, enabling complete feathering of the propeller in flight.

## RESCUE SYSTEM

Shark is standard equipped with 2-handle Galaxy rescue system **GRS 6 SD**



### Galaxy GRS 6SD rescue system description:

The GRS canopy is drawn away from the aircraft in a short special compact container to a length of 15-18 metres.

At this point the whole hanging system from canopy to aircraft is stretched, a container lock is released and the canopy can be inflated directly, significantly reducing the risk of debris damaging the canopy.

The whole design of the GRS is purposefully constructed for the fastest possible opening which enhances the potential of a rescue of the aircraft and crew from the lowest possible height.

The main canopy system is open and fully inflated above the aircraft between 1.5 - 6.0 seconds after being fired with regard to the flight speed.

This means that a rescue can be successful from as little as 30 m to 150m over the ground, depending on the installation, position of the aircraft, its speed and trajectory.

### Maximum opening speed:

GRS 6/473SD SPEEDY / H	321 km/h ( 200,6 mph )
GRS 6/473SD SPEEDY DULV	310 km/h ( 193,8 mph )
With max. weight 525kg (1666lbs)	270km/h (168,7mph)GRS 6/600SD
Maximum allowable load / unit weight	473 kg

### Minimum opening height:

80m (240ft) above the ground  
90 km/hod.(56mph)

### Thrust into construction in opening:

GRS 6/473SD SPEEDY	max 23,5kN ... 5,0G
GRS 6/473SD SPEEDY H	max 24,0kN ... 5,2G

### Canopy:

- circled without centre line,  
24 lines, area 96 m2.

### Standard repack cycle:

6 years, planned service life 30 years  
Rocket engine 650 Newton/sec

### Certification:

According to ZS-2 LAA CS  
DULV German : GRS 6-473SD SPEEDY



**c/o Fly Boys S.r.l.**

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