Letecká amatérská asociace ČR – Light Aircraft Association of the Czech Republic

Type Certificate

Issued by the Light Aircraft Association of the Czech Republic(hereinafter LAA CR), based on the delegation by the Ministry of Transport to perform the state administration in the matters of sports flying equipmentin accordance with the Section 82, Subsection 1 of Act No. 49/1997 Coll. On civil aviation and amending and supplementing Act No. 455/1991 Coll. On Trade Licensing (The Trade Licensing Act), as amended by later regulations of the Ministry of Transport

Aircraft type designation:

Two-seat, single-engine, aerodynamically controlled , all-composite low wing, aircraft– Sport Flying Equipment.

Type designation: **Ellipse Spirit**

Maximum take off mass 600 kg including the ballistic recovery parachute.
Detailed technical specification is stated in the Data Sheet.
Supplement a) dated January 1, 2021 - Ellipse Spirit b (classic control lever)
Supplement b) dated June 7, 2021 - Ellipse Spirit RG (retractable landing gear)
Supplement c) dated December 4, 2023 – Ellipse Spirit 915 (Rotax 915 iS)
Supplement d) dated July 16, 2024 – Ellipse Spirit 914 (Rotax 914)
Supplement e) dated June 12, 2025 – Ellipse Spirit 916 (Rotax 916iSc)

Type certificate holder:

ellipse aero s.r.o.
U Hellady 697/4
140 00 Praha 4 - Michle
Czech Republic
ID: 071 09 075

Approved by the LAA CR Technical commission on:

24 th june 2020

The Type certificate is registered at the LAA CR under the reference:

ULL 02 / 2020

LAA CR Chief Technical Inspector: ***ing. Petr Tax***

Type certificate number:	**ULL – 02 / 2020**
Type certificate holder:	ellipse aero s.r.o.
Type SLZ:	**Ellipse Spirit**
Date of issuance:	1/7/2020
Date of issuance supplement a):	1/1/2021
Date of issuance supplement b):	7/7/2021
Date of issuance supplement c):	4/12/2023
Date of issuance supplement d):	16/7/2024
Date of issuance supplement e):	12/6/2025

Type certificate annex no. ULL - 02 / 2020

I. Generally

1. Type designation: **Ellipse Spirit**
2. Category: Light sport aircraft, microlight aerodynamically controlled aircraft
3. Type certificate holder: ellipse aero s.r.o.
   U Hellady 697/4, 140 00 Praha 4 – Michle, Czech Republic
   IČO: 071 09 075, DIČ: CZ071 09 075
5. Application date: 19th March of 2019
6. Approval date: 24th June of 2020

II. Certification specification

1. Airworthiness requirements: UL2 – část I. vydání 1. 2019. Ultralehké letouny řízené aerodynamicky, upravené znění ze dne 27.3.2019.
2. Special conditions: N/A
3. Exceptions: N/A

III. Technical data, performance, operation limitation

1. Type definition: Aircraft type is defined by set of drawings and Type definition

2. Description: Ellipse Spirit aircraft is fully made of composite materials. It is equipped with self-supporting low wing. Cockpit seats there are arranged side by side. Airframe structure is made of carbon or carbon/aramid composite structures, mostly with sandwich core. Fuselage has an oval cross section and it is made of composite sandwich structures. Wing consists of carbon composite sandwich skin with one main and one auxiliary spar. Spare cabs are made of unidirectional carbon layers and shear web is made of carbon fabrics with foam core. Main wing spars there are connected inside the fuselage using two main pins. Wings are connected to the fuselage using four pins located in root ribs. Ailerons and fowler flaps there are connected to the auxiliary wing spare. Flaps are actuated using electric motor situated inside the fuselage which is connected with flaps by flexible rods. Wing shape is elliptical and wing section is MS 0313, no geometric twist is used. In front of the ailerons there is SLOT on the leading edge. Tail section is a composite structure with one-piece horizontal stabilizer in T arrangement. In the centre of elevator there is a trim tap actuated by electric servo located in elevator.

3. Equipment: For technical airworthiness approval of light sport aircraft issue, basic equipment according certification specification listed in chapter II must be installed.

4. Basic technical data:

1. Dimensions

Span	8,00 m
Length	6,70 m
High	2,15 m

Wing

Area	9,474 m^2
Root wing section chord	1,45 m
Tip wing section chord	N/A - ellipse
Aspect ratio	6,756
Wing loading at MTOM 600kg	63,3 kg/m^2

Aileron

Area	0,341 m^2
Aileron deflection (up/down)	15 ^{0}/10 ^{0}

Wing trailing edge flap

Area	0,734 m^2
Flap deflection - cruise	0 ^{0}
Flap deflection – take-off	10 ^{0}
Flap deflection – approach, landing	20°, 30 ^{0}

Horizontal stabilizer

Span	2,6 m
Area	1,61 m^2
Elevator deflection (up/down)	18^0 / 12^0

Vertical fin

Area	1,247 m^2
Rudder deflection	+/- 22^0

Undercarriage

Main undercarriage wheelbase	2,08m
Main and front undercarriage wheelbase	1,57 m
Main and front wheel dimensions	350x100
Main undercarriage tire pressure	2,2-2,5 bar
Front undercarriage tire pressure	1,8-2 bar
Brakes	Hydraulic disc brakes
Main undercarriage suspension	Composite spring
Front undercarriage suspension	Steal spring

Undercarriage – retractable landing gear

Main undercarriage wheelbase	1,85m
Main and front undercarriage wheelbase	1,62 m
Main and front wheel dimensions	350x100
Main undercarriage tire pressure	2,2-2,5 bar
Front undercarriage tire pressure	1,8-2 bar
Brakes	Hydraulic disc brakes
Main undercarriage suspension	Steal spring – hydraulic damper
Front undercarriage suspension	Steal spring

2. Mass

Max. take-off mass	600 kg
Max. take-off mass with emergency parachute system	600 kg
Max. useful load	280 kg
Min. crew mass	65 kg
Max. baggage mass	15 kg
Wing fuel tanks	2x40 l (2x60l)
Standard Empty mass including emergency parachute system	381 kg

Airspeed and performance

Engine ROTAX 912 ULS (73,5 kW / 100 HP), propeller E-PROPS DURANDAL 100

Performance in ISA conditions.	Take-off mass 600 kg Airspeed CAS
Stall speed flaps extended V_{SO}	72 km/h
Stall speed flaps retracted V_{S1}	89 km/h
Max. speed – flaps extended (30°) V_{FE}	130 km/h
Design airspeed V_A	177 km/h
Max. horizontal flight airspeed V_H	238 km/h
Never exceed speed V_{NE}	302 km/h
Take-off length 15 m obstacle, grass	320 m
Rate of climb	5,67 m/s at 120 km/h
Rough airspeed V_{RA}	240 km/h

Engine ROTAX 912 ULS (73,5 kW / 100 HP), propeller Mühlbauer MTV-33-1-A/175-200

Performance in ISA conditions.	Take-off mass 600 kg Airspeed CAS
Stall speed flaps extended V_{SO}	72 km/h
Stall speed flaps retracted V_{S1}	89 km/h
Max. speed – flaps extended (30°) V_{FE}	130 km/h
Design airspeed V_A	177 km/h
Max. horizontal flight airspeed V_H	240 km/h
Never exceed speed V_{NE}	302 km/h
Take-off length 15 m obstacle, grass	320 m
Rate of climb	5,67 m/s at 120 km/h
Rough airspeed V_{RA}	240 km/h

Engine ROTAX 912 ULS (73,5 kW / 100 HP), propeller SWIRLBLACK-3-R

Performance in ISA conditions.	Take-off mass 600 kg Airspeed CAS
Stall speed flaps extended V_{SO}	72 km/h
Stall speed flaps retracted V_{S1}	89 km/h
Max. speed – flaps extended (30°) V_{FE}	130 km/h
Design airspeed V_A	177 km/h
Max. horizontal flight airspeed V_H	240 km/h
Never exceed speed V_{NE}	302 km/h
Take-off length 15 m obstacle, grass	350 m
Rate of climb	5 m/s at 120 km/h
Rough airspeed V_{RA}	240 km/h

Engine ROTAX 915 iS (104 kW / 139,5 HP), propeller SWIRLBLACK-4-R

Performance in ISA conditions.	Take-off mass 600 kg Airspeed CAS
Stall speed flaps extended V_{SO}	72 km/h
Stall speed flaps retracted V_{S1}	89 km/h
Max. speed – flaps extended (30°) V_{FE}	130 km/h
Design airspeed V_A	177 km/h
Max. horizontal flight airspeed V_H	260 km/h
Never exceed speed V_{NE}	302 km/h
Take-off length 15 m obstacle, grass	312 m
Rate of climb	6,6 m/s at 145 km/h
Rough airspeed V_{RA}	240 km/h

Engine ROTAX 915 iS (104 kW / 139,5 HP), propeller Mühlbauer MTV-34-1-A

Performance in ISA conditions.	Take-off mass 600 kg Airspeed CAS
Stall speed flaps extended V_{SO}	72 km/h
Stall speed flaps retracted V_{S1}	89 km/h
Max. speed – flaps extended (30°) V_{FE}	130 km/h
Design airspeed V_A	177 km/h
Max. horizontal flight airspeed V_H	260 km/h
Never exceed speed V_{NE}	302 km/h
Take-off length 15 m obstacle, grass	300 m
Rate of climb	6,6 m/s at 145 km/h
Rough airspeed V_{RA}	240 km/h

Engine ROTAX 914 (84,8 kW / 115 HP), propeller SWIRLBLACK-3-R

Performance in ISA conditions.	Take-off mass 600 kg Airspeed CAS
Stall speed flaps extended V_{SO}	72 km/h
Stall speed flaps retracted V_{S1}	89 km/h
Max. speed – flaps extended (30°) V_{FE}	130 km/h
Design airspeed V_A	177 km/h
Max. horizontal flight airspeed V_H	240 km/h
Never exceed speed V_{NE}	302 km/h
Take-off length 15 m obstacle, grass	350 m
Rate of climb	5 m/s at 120 km/h
Rough airspeed V_{RA}	240 km/h

Engine ROTAX 916 iSc (117 kW / 157 HP), propeller DUC-TIGEBLACK-R

Performance in ISA conditions.	Take-off mass 600 kg Airspeed CAS
Stall speed flaps extended V_{SO}	72 km/h
Stall speed flaps retracted V_{S1}	89 km/h
Max. speed – flaps extended (30°) V_{FE}	130 km/h
Design airspeed V_A	177 km/h
Max. horizontal flight airspeed V_H	260 km/h
Never exceed speed V_{NE}	302 km/h
Take-off length 15 m obstacle, grass	300 m
Rate of climb	5,8 m/s at 150 km/h
Rough airspeed V_{RA}	240 km/h

CG position range

Limit front CG position: **21 %** MAC
Limit aft CG position: **35 %** MAC

The Datum is located at the leading edge of the wing at the root rib. Mean aerodynamic chord length MAC=1,257m, MAC shift aft of datum is 0,132m.

3. Flight load factors

Maximal positive / negative ……. +4,0 / -2,0.

4. Power-plant

Rotax 912 ULS.

Maximal take-off power 73,5 kW/ 5800 min^{-1} (max duration 5 min).
Maximal continuous power 69 kW/5500 min^{-1}.

Rotax 912 iS.

Maximal take-off power 73,5 kW/ 5800 min^{-1} (max duration 5 min).
Maximal continuous power 72 kW/5500 min^{-1}.

Rotax 915 iS.

Maximal take-off power	104 kW/ 5800 min^{-1} (max duration 5 min).
Maximal continuous power	99 kW/5500 min^{-1}.

Rotax 914.

Maximal take-off power	104 kW/ 5800 min^{-1} (max duration 5 min).
Maximal continuous power	73,5 kW/5500 min^{-1}.

Rotax 916 iS.

Maximal take-off power	117 kW/ 5800 min^{-1} (max duration 5 min).
Maximal continuous power	101 kW/5500 min^{-1}.

5. Propeller

a) Two-blade constant speed Mühlbauer MTV-33-1-A/175-200.

b) Three-blade on ground variable pitch E-PROPS DURANDAL 100.

c) Three-blade constant speed DUC SWIRLBLACK-3-R

d) Four-blade constant speed DUC SWIRLBLACK-4-R

e) Three-blade constant speed Mühlbauer MTV-34-1-A

f) Three-blade constant speed DUC TIGERBLACK-R

6. Fuel

EUROSUPER RON 95 unleaded according DIN 51607,Ö- NORM 1100 AVGAS 100 LL.
BA 95 Natural recommended in Czech republic.

7. Oil

Oil specification API SF(SG) or higher, designated for 4-stroke motorcycles
(with gear lubrication additives).

8. Rescue parachute system

GRS 6 600 SD Speedy 115m^2 installed according Galaxy company standards.

IV. Operation and maintenance documents:

- Flight and maintenance manual together with appendix of optional equipment.
- Operation manual ROTAX 912/915.
- Propeller technical description and operation manual.

V. Annex:

Annex a): Classical control stick addition according type certificate Ellipse Spirit b chapter 3.4. Controls in the cockpit there are doubled. Standard hand control sticks are used. Trim control there is situated on control sticks. Rudder paddles there are adjustable. Throttle is situated in the central console between seats.

Annex b): Retractable landing gear addition according type certificate Ellipse Spirit RG chapter 3.3. Engine Rotax 912iS addition according type certificate Ellipse Spirit RG chapter 3.7.

Annex c): Addition of Rotax 915iS engine and constant speed propellers DUC SWIRLBLACK-3-R, DUC SWIRLBLACK-4-R and Mühlbauer MTV-34-1-A according type description ***Ellipse spirit R09*** (chapter. 3.7, 3.8, 4.5, 4.6, 4.9)

Annex d): Addition of Rotax 914 engine and constant speed propellers DUC SWIRLBLACK-3-R according type description ***Ellipse spirit R10*** (chapter. 3.1, 3.7, 3.8, 4.5)

Annex e): Addition of Rotax 916iSc engine and constant speed propellers DUC TIGERBLACK-R according type description ***Ellipse spirit R11*** (chapter. 3.1, 3.7, 3.8, 4.5, 4.6)

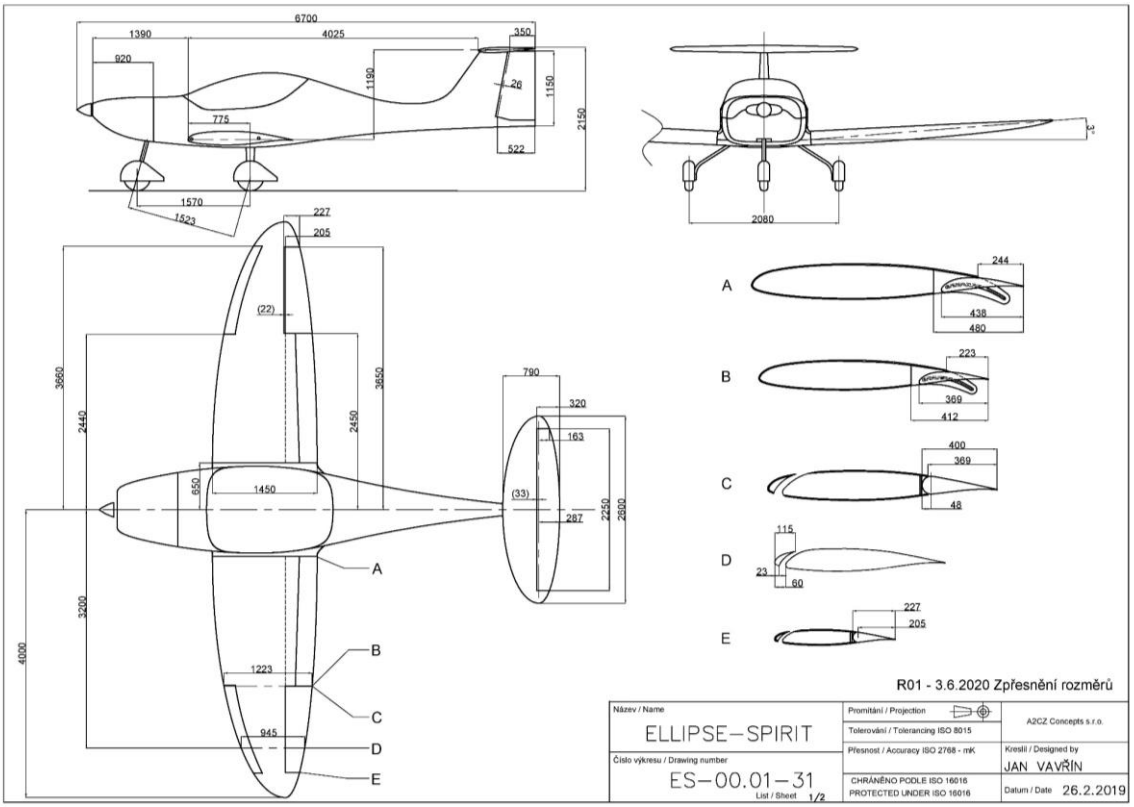
Notes:

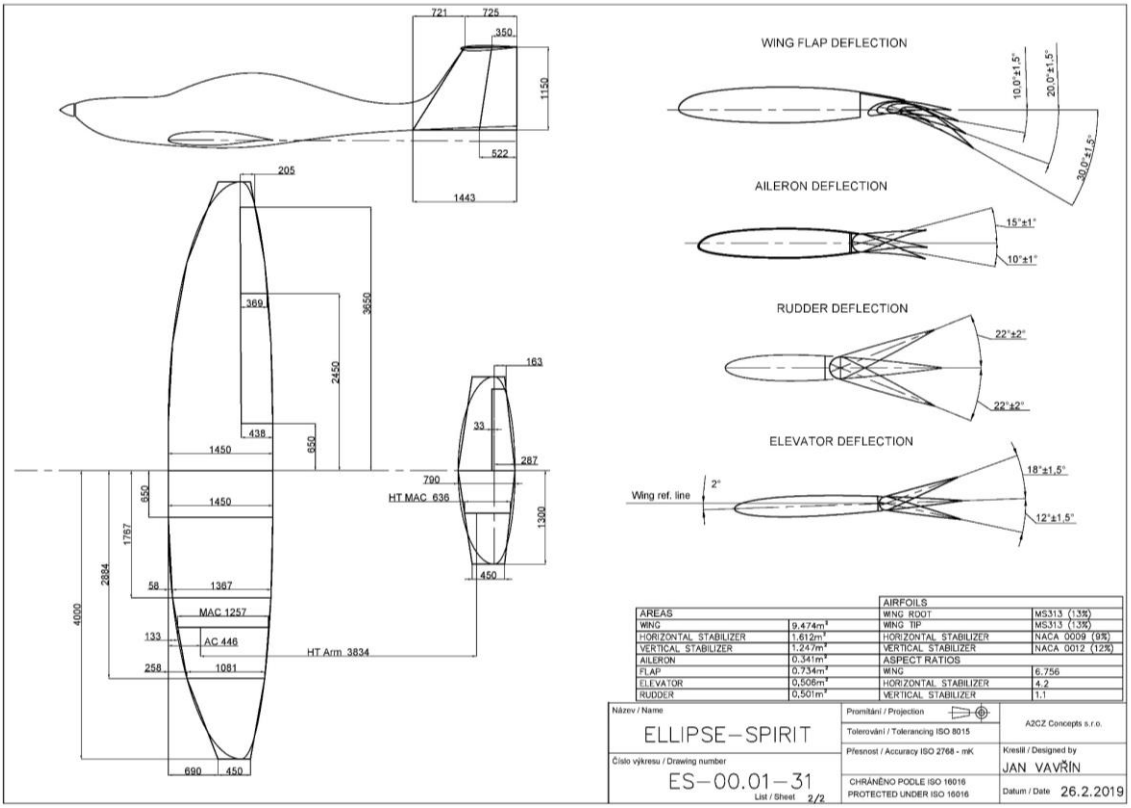
1. Each aircraft must be equipped with actual weight and balance protocol with equipment list to issue airworthiness technical approval
2. Aircraft must be equipped with placards listed in flight manual

VI. Appendix:

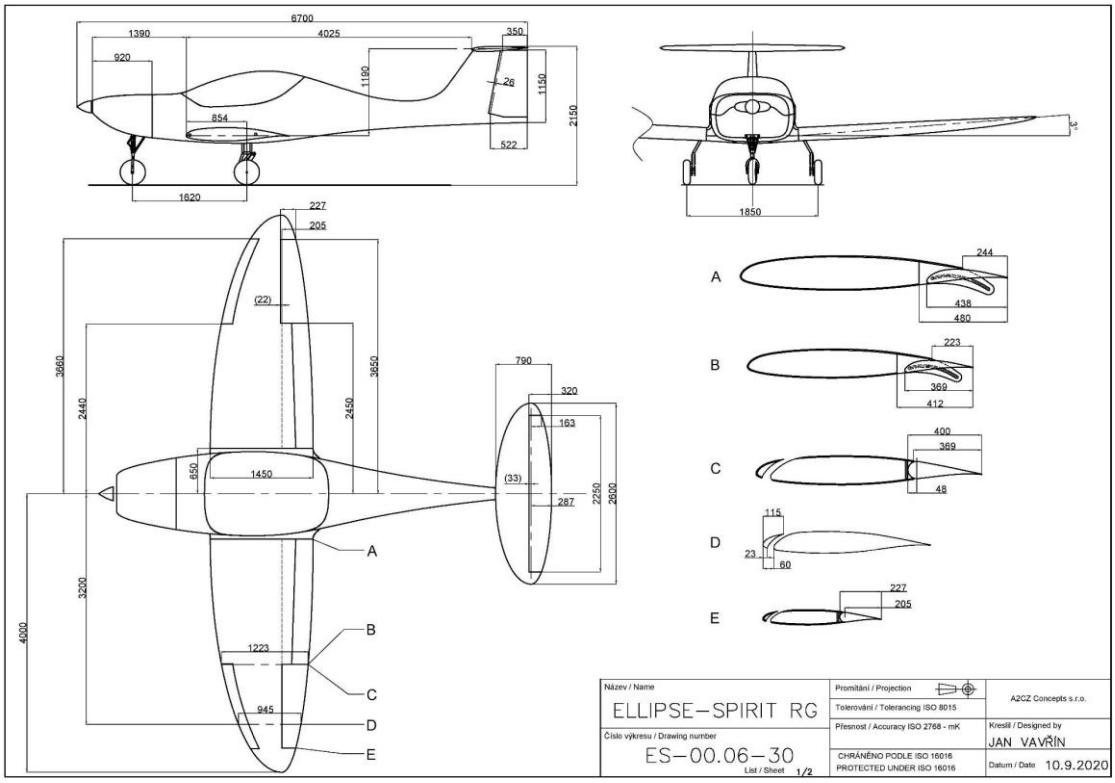
- 3D Ellipse Spirit aircraft drawing according type definition ULL 02/2020.
- 3D Ellipse Spirit RG aircraft drawing according type definition ULL 02/2020.

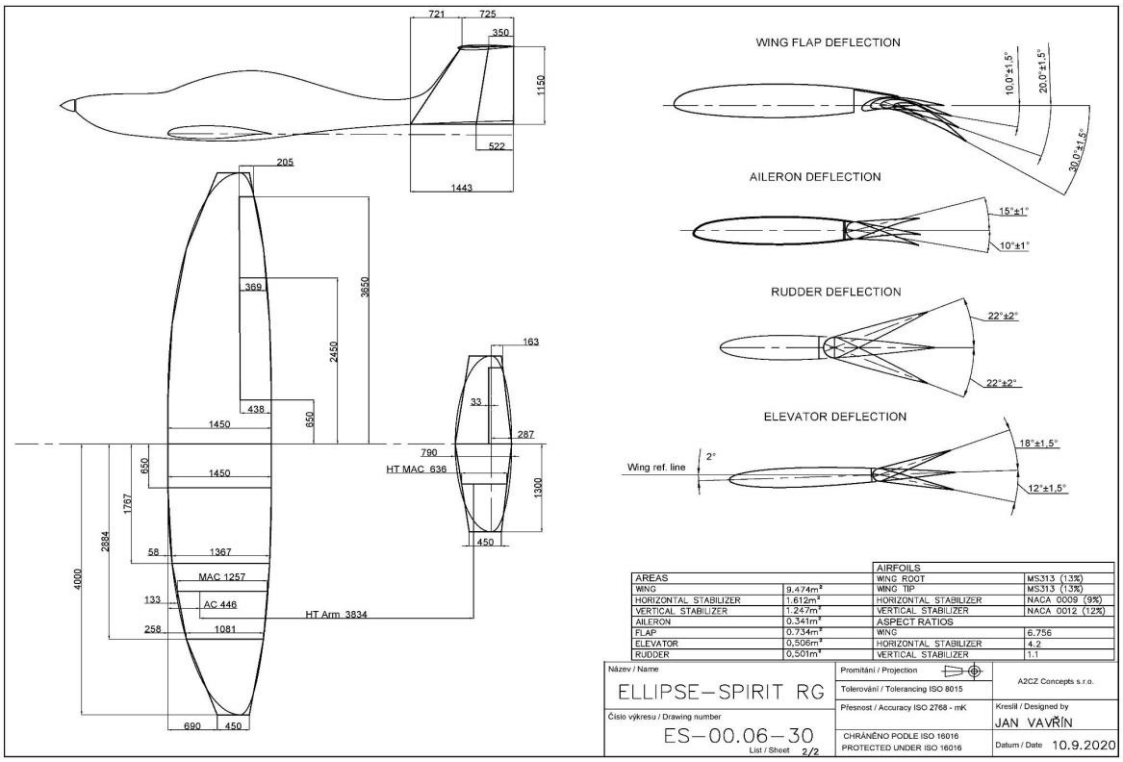
3D Ellipse Spirit aircraft drawing according ULL 02/2020.





3D Ellipse Spirit RG aircraft drawing according ULL 02/2020.





-End-