

Prezes Urzędu Lotnictwa Cywilnego  
*President of the Civil Aviation Authority*

ŚWIADECTWO UZNANIA ZATWIERDZENIA TYPU  
*Type Approval Recognition Certificate*

NUMER: **UL-A.00-002/2024**  
Reference:

Niniejsze świadectwo uznania zatwierdzenia typu zaświadcza, że określony typ/model ultralekkiego statku powietrznego został uznany za akceptowalny w Rzeczypospolitej Polskiej zgodnie z obowiązującymi przepisami polskiego lotnictwa cywilnego i pozostaje w mocy przez czas nieokreślony, chyba że zatwierdzenie zostanie zrzucone, zawieszono lub cofnięte oraz że został wpisany na listę typów zatwierdzonych prowadzoną przez Prezesa Urzędu Lotnictwa Cywilnego, o której mowa w przepisach wydanych na podstawie art. 33 ust. 2 i 4 ustawy – Prawo lotnicze (Dz.U. z 2022 r. poz. 1235, 1715, 1846, 2185 i 2642).

*This Type Approval Recognition Certificate certifies that the ultralight aircraft type/model specified has been found acceptable in Republic of Poland in accordance with the applicable Polish Civil Aviation regulations and shall remain as such for an unlimited duration unless the approval is surrendered, suspended or revoked and has been entered on the list of approved flying device types managed by the President of the Civil Aviation Authority, referred to in the regulations issued on the basis of Art. 33 para 2 and 4 of the Aviation Law Act dated July 3<sup>rd</sup>, 2002 (JL. 2022, item 1235, 1715, 1846, 2185 and 2642).*

Państwo projektu  
*State of Design*

**Czech Republic**

Państwo produkcji  
*State of Manufacture*

**Czech Republic**

Posiadacz zatwierdzenia typu  
*Type Approval Holder*

**Direct Fly, s.r.o.**

Špitálka 49/8, 602 00 Brno, Czech Republic

Wytwórca  
*Manufacturer*

**Direct Fly, s.r.o.**

Špitálka 49/8, 602 00 Brno, Czech Republic

Oznaczenie typu produktu  
*Product Type Designation*

**ALTO NG**

Numer zatwierdzenia typu  
*Type Approval Number*

**ULL 02/2024**

Arkusze danych do zatwierdzenia typu  
*Type Certificate Data Sheet*

**ULL 02/2024**

Przyjęte wymagania techniczne  
*Type Certification Basis*

**UL2 – Part I, edition 1, 2019**

Uwagi  
*Remarks*

Approved by the LAA CR Technical commission on:

03.04.2024, date of issuance TCDS: 15.04.2024

EZD ref. LTT-3.5460.5.2024

**Z upoważnienia Prezesa Urzędu Lotnictwa Cywilnego**  
*On behalf of President of the Civil Aviation Authority*

**Marcin Perkowski**

**Zastępca Dyrektora Departamentu Techniki Lotniczej**

*Deputy Director, Aviation Technical Department*

(pismo zostało wydane w postaci elektronicznej

i opatrzone kwalifikowanym podpisem elektronicznym)

*(the letter was published in electronic form*

*and signed with a qualified electronic signature)*

Data pierwszego wydania: **04.06.2024**  
*Date of original issue:*

Data ostatniej zmiany: --  
*Date of last revision:*



**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 equipment in 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-metal construction, low wing aircraft– Sport Flying Equipment.

Type designation: **ALTO NG**

Maximum take off mass 600 kg including the ballistic rescue system.  
Detailed technical specification is stated in the Data Sheet.

### Type certificate holder:

**Direct Fly, s.r.o.**  
Špitálka 49/8  
602 00 Brno  
Česká republika

ID: 27683737

Approved by the LAA CR Technical commission on:

**April 3, 2024**

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

**ULL 02 / 2024**

Letecká amatérská asociace ČR  
Ke Kably 289  
102 00 Praha 10  
TEL: 242 403 587

LAA CR Chief Technical Inspector:

**ing. Petr Tax**



Type certificate number:	<b>ULL – 02 / 2024</b>
Type certificate holder:	<b>Direct Fly, s.r.o.</b>
Type SLZ:	<b>ALTO NG</b>
Date of issuance:	April 15, 2024

**Type certificate annex no. ULL - 02 / 2024**

**I. Generally**

1. Type designation: **ALTO NG**
2. Category: Light sport aircraft, microlight aerodynamically controlled aircraft
3. Type certificate holder: Direct Fly, s.r.o.  
Špitálka 49/8  
602 00 Brno  
Czech Republic  
ID: 27683737
5. Application date: March 23, 2021
6. Approval date: April 3, 2024

**II. Certification specification**

1. Airworthiness requirements: UL2 – part I. edition 1. 2019.  
Aerodynamically controlled ultralight aircraft, revised version of 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 the Type definition.
  
2. Description: The ALTO NG is an all-metal low-flying aircraft with a riveted duralumin airframe. Some non-load-bearing parts of the aircraft - such as the engine cowling, wing tips, HTU, VTU and wheel covers are made of composite materials. The aircraft is equipped with two seats with side-by-side arrangement. The three-wheel landing gear has a pilot-operated front landing gear leg. Hydraulic brakes are located on the main landing gear.
  - 2.1 Airframe: The airframe of the ALTO NG is a semi-monocoque, duralumin construction incorporating duralumin and steel struts, bulkheads, and an aluminum alloy load-carrying skin .
  - 2.2 Fuselage: The fuselage has a rectangular cross-section in the lower part and an oval cross-section in the upper part. The semi-monocoque structure is glued and riveted. The side and bottom panels are reinforced with diagonal stiffeners. The keel is an integral part of the fuselage. The crew cabin is located in the central part of the fuselage. Access to the cabin is provided by sliding the movable part of the cabin. The engine is located in the forward section and is separated from the crew compartment by a stainless-steel firewall to which the engine is also attached. The cabin of the aircraft is drop-shaped. Plexiglas is glued to the cabin frame, which is made of aluminium alloy. The cabin is lockable with a lock located on the top of the cabin. The canopy is mounted on steel runners allowing forward opening.
  - 2.3 Wing: The wing platform is of rectangular shape. The wing structure consists of a rear spar, main spar, cross ribs and longitudinal bracing. The skins are made of aluminium alloys. The wing is equipped with ailerons, slotted flaps and integral tanks. The spars of the two wing halves are connected to the center-section by fitted bolts.
  - 2.4 Tail surfaces: The horizontal tail surfaces are of standard arrangement. The HTU consists of a stabilizer, elevator and two trim tabs. The HTU structure is semi- monocoque , comprising ribs, a support cover and a spar. The horizontal tail surfaces platform is of rectangular. platform is of rectangular shape. The VTU means the rudder and keel, which is an integral part of the fuselage.The structure of the VTU is semi-monocoque, comprising ribs, a load-bearing skin and a spar.
  - 2.5 Landing gear: The aircraft is equipped with a tricycle landing gear. The nose wheel is steerable together with the rudder to which it is coupled. The main

landing gear is made of composite materials. The legs themselves are flexible and act as a shock absorber/suspension. The wheels of the main landing gear are equipped with hydraulic brakes controlled by a central brake with a parking brake function located between the pilots. All three wheels can be fitted with aerodynamic covers supplied by the manufacturer.

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

Wing span	8,13 m
Length	6,22 m
Height	2,32 m

Wing

Area	10,6 m <sup>2</sup>
MAC	1,320 m
Airfoil	NACA 4415
Aspect ratio	6,13
Wing loading at MTOM 600kg	56,60 kg/m <sup>2</sup>

Aileron

Aileron length	1,070 m
Area	0,310 m <sup>2</sup>
Aileron deflection (up/down)	26 <sup>0</sup> /22 <sup>0</sup> ±1 <sup>0</sup>

Wing trailing edge flap

Flap length	2,1 m
Area	0,595 m <sup>2</sup>
Flap deflection - cruise	0 <sup>0</sup>
Flap deflection – take-off	10 <sup>0</sup> +2 <sup>0</sup>
Flap deflection – approach, landing	20°+2 <sup>0</sup> , 30 <sup>0</sup> +2 <sup>0</sup>

Horizontal tail units

Span	2,85 m
Area	2,17 m <sup>2</sup>
Elevator area	1,05 m <sup>2</sup>
Elevator deflection (up/down)	28 <sup>0</sup> / 20 <sup>0</sup> -2 <sup>0</sup>

Vertical tail units

Area	0,950 m <sup>2</sup>
Rudder area	0,410 m <sup>2</sup>
Rudder deflection	+/- 25 <sup>0</sup> +3 <sup>0</sup>

Undercarriage

Main undercarriage wheeltrack	1,400 m
Main and front undercarriage wheelbase	1,668 m
Main and front/main wheel dimensions	13x5"/14x4" (15x6")
Main undercarriage tire pressure	200± 20 kPa
Front undercarriage tire pressure	200± 20 kPa
Brakes	hydraulic disc brakes
Main undercarriage suspension	composite spring
Front undercarriage suspension	elastomer spring

2. Mass

Max. take-off mass	600 kg
Max. useful load	270 kg
Min. crew mass	55 kg
Max. baggage mass	15 kg
Wing fuel tanks	2x46 l
Max. standard Empty mass	381 kg

3. Airspeed and performance

Engine ROTAX 912 ULS (73,5 kW / 100 HP), propeller Woodcomp KW-21

Performance in ISA conditions.	Take-off mass 600 kg Airspeed CAS
Stall speed flaps extended V <sub>SO</sub>	67 km/h
Stall speed flaps retracted V <sub>S1</sub>	89 km/h
Max. speed – flaps extended (30°) V <sub>FE</sub>	138 km/h
Design manoeuvring airspeed V <sub>A</sub>	188 km/h
Max. horizontal flight airspeed V <sub>H</sub>	184 km/h
Never exceed speed V <sub>NE</sub>	255 km/h
Take-off length 15 m obstacle, grass - concrete	400 m, 420 m
Rate of climb	4,83 m/s at 125 km/h
Rough airspeed V <sub>RA</sub>	206 km/h

Engine ROTAX 912 ULS (73,5 kW / 100 HP), propeller FITI ECO II

Performance in ISA conditions.	Take-off mass 600 kg Airspeed CAS
Stall speed flaps extended $V_{SO}$	67 km/h
Stall speed flaps retracted $V_{SI}$	89 km/h
Max. speed – flaps extended (30°) $V_{FE}$	138 km/h
Design manoeuvring airspeed $V_A$	188 km/h
Max. horizontal flight airspeed $V_H$	201 km/h
Never exceed speed $V_{NE}$	255 km/h
Take-off length 15 m obstacle, grass - concrete	420 m, 445 m
Rate of climb	3,06 m/s at 125 km/h
Rough airspeed $V_{RA}$	206 km/h

Engine ROTAX 912 ULS (73,5 kW / 100 HP), propeller Woodcomp SR 3000

Performance in ISA conditions.	Take-off mass 600 kg Airspeed CAS
Stall speed flaps extended $V_{SO}$	67 km/h
Stall speed flaps retracted $V_{SI}$	89 km/h
Max. speed – flaps extended (30°) $V_{FE}$	138 km/h
Design manoeuvring airspeed $V_A$	188 km/h
Max. horizontal flight airspeed $V_H$	207 km/h
Never exceed speed $V_{NE}$	255 km/h
Take-off length 15 m obstacle, grass - concrete	400 m, 420 m
Rate of climb	5,03 m/s at 125 km/h
Rough airspeed $V_{RA}$	206 km/h

4. CG position range

Limit front CG position:     **25 % MAC**  
 Limit aft CG position:       **34 % MAC**

The reference plane is the fire wall/ engine plate. The displacement of the MAC is 535 mm. Mean aerodynamic chord - depth of the mean aerodynamic chord  $MAC=1,320$  m.

5. Flight load factors

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

6. Power-plant

Rotax 912 ULS.

Maximal take-off power     73,5 kW/ 5800  $\text{min}^{-1}$  (max duration 5 min).  
 Maximal continuous power     68,5 kW/ 5500  $\text{min}^{-1}$ .

7. Propellers

- Adjustable hydraulic three-bladed in flight Woodcomp KW-21, diameter 1720mm.
- Adjustable three-bladed on the ground FITI ECO II, diameter 1580mm.
- Adjustable electric three-bladed in flight Woodcomp SR 3000, diameter 1700mm.

#### 8. Fuel

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

#### 9. Oil

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

#### 10. Rescue parachute system

Galaxy GRS 6/600SD Speedy installed according Galaxy company standards.

### IV. Operation and maintenance documents:

- Flight and maintenance manual together with appendix of optional equipment.
- Operation manual ROTAX 912.
- Propeller technical description and operation manual.
- Operation manual Galaxy 600 SD.
- Optional equipment manuals.

### V. Annex:

With an ALTO NG ultralight equipped with a towing device, glider tows are permitted within these limits:

- Max. tow safety link strength 300daN +/- 30 daN.
- MTOM of towed glider 500 kg for use of WOODCOMP KW-21 propeller.
- Optimal glider towing speed 125 km/h (IAS).
- Min. glider towing speed with flaps 115 km/h (IAS).
- Maximum glider towing climb rate for MTOM 500kg glider at 125km/h (IAS).

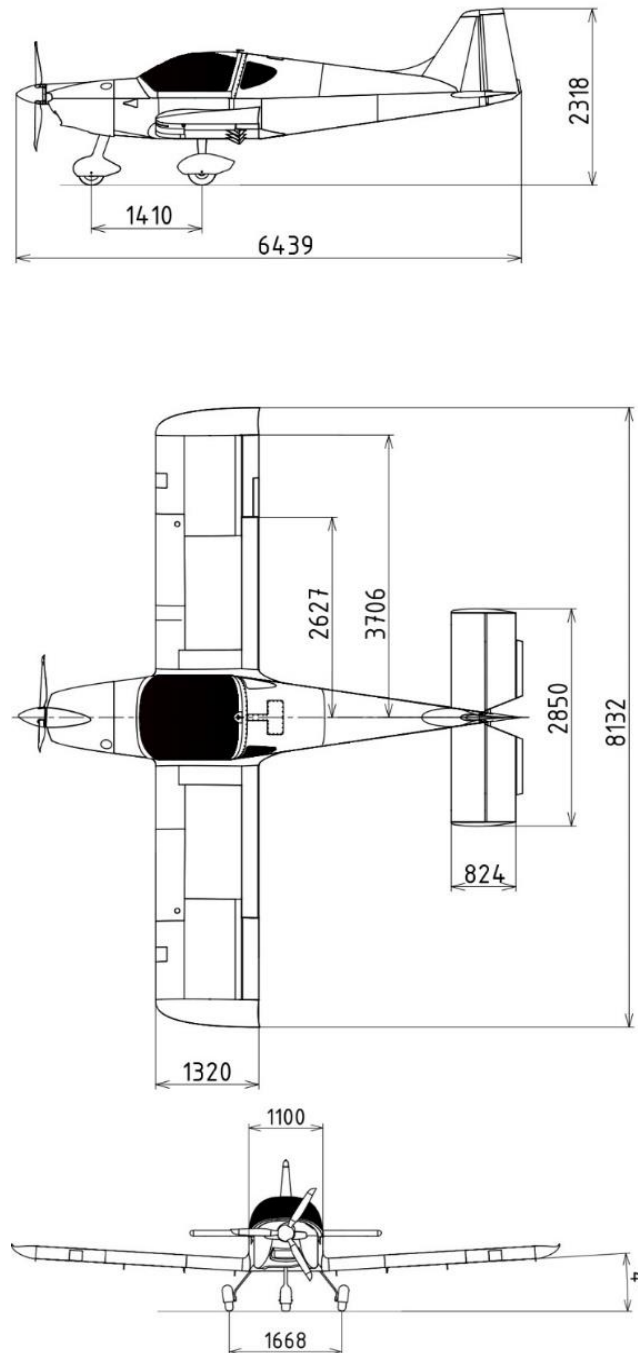
The towing aircraft shall comply with the requirements of UL-2 Annex III / Part I (Supplementary requirements for towing gliders by UL aircraft). Procedures and limitations for towing are given in the supplement to the flight manual.



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. 3-view ALTO NG aircraft drawing according type definition.



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