VELIS ELECTRO

EASA TYPE-CERTIFIED

600 KG MTOM, DAY VFR, STANDARD CATEGORY AIRPLANE

IT’S TIME FOR QUIET, EMISSION-FREE TRAINING
VELIS Electro

World’s first Type-Certified electric aircraft

The two-seater, intended primarily for pilot training, is a game-changing aircraft in terms of technological innovations and cost-efficiency. Velis Electro can be operated commercially and is fully approved for pilot training as well as other operations. Featuring noise levels of only 60 dBA, and produces no combustion gases at all. With its quietness, Velis Electro can bring flying much closer to urban areas without upsetting the quality of life.

Economy and safety

The power is delivered by 345 VDC electric system built around a liquid-cooled in-house developed high performance system of two batteries connected in parallel, installed in a redundant 2-unit arrangement, total nominal capacity 24.8 kWh. Thermal runway inhibiting, crashworthy, HIRF/EMI tolerant.

One battery pack is located in the nose of the aeroplane and the second behind the cabin. This ensures redundancy of the power source: in case of battery failure, the malfunctioning battery gets automatically disconnected from the system. A single battery is capable of full operation and has enough power to support climbing and continuation of flight. Batteries can be charged via an onboard charging port using a Pipistrel electric charger. The whole operation is overseen by the Main computer, displaying the status of all systems on Pipistrel EPSI 570C. Its revolutionary powertrain is entirely liquid cooled, including the batteries, and proved the ability to withstand faults, battery thermal runway events and crash loads as part of the certification process. Velis Electro can operate in cold, hot and rain. The liquid-cooling system consists of a radiator and two electrically driven pumps installed in series, located behind the rear battery pack. An air intake for the radiator is located on left side of the fuselage and the warm air leaves at the bottom. Two high power axial fans are installed behind the radiator in order to allow battery cooling during charging. The fans are automatically controlled and monitored by the BMS for seamless operation. Unlike a start-up procedure of a conventionally powered airplane, the Velis Electro is powered-up by four switches and requires no warm-up time before take-off. This paradigm shift coupled with unprecedented quietness both inside the cockpit as well as from the outside, the Velis Electro truly is a game-changing aircraft to revolutionise your organisation and empower a new generation of aviators.

Velis Electro is equipped with a Pipistrel type-certified 57.6 kW liquid cooled electric engine, which provides power to the aircraft and produces no combustion gases at all, and Pipistrel’s three-bladed fixed pitch composite propeller.

As the fundament of Velis Training System, the Velis Electro was designed to be simple to operate and maintain, without compromising safety. Employing Pipistrel’s type-certified electric engine, the Velis Electro delivers power instantly, using a simplified user interface in a cockpit that maintains the same look-and-feel of its conventionally powered siblings. The reduced number of moving parts greatly decreases maintenance costs. Risk of malfunctions is minimized thanks to its built-in continuous health-monitoring system. This enhanced reliability allows the Velis Electro to have more than double the lifespan of powertrain elements in comparison to the previous generation of electric aeroplanes.

Timeline of Pipistrel’s contribution to electric flight


PIPISTREL
The greenest way of learning to fly!
Learn to fly on the VELIS Electro and experience the future of flying first hand - now!

Design loads

+4 G, -2 G. All parts have been tested to a minimum safety factor of 1.875, meaning they were subjected to a load of at least 7.5 G during testing.

Structure

The structure of the Pipistrel VELIS ELECTRO aircraft utilizes composite technologies introduced by Pipistrel in 1995. The entire structure is made from composite materials utilizing predominantly carbon fiber, Kevlar and fiberglass in different areas.

Weights

The maximum take-off weight for the Pipistrel VELIS Electro is 600 kg (1320 lbs) with the Empty weight with batteries of 428 kg (941 lbs) and Payload of 172 kg (378 lbs).

Engine

Pipistrel E-811 EASA Type Certified according applicable airworthiness code based on CS-22 (Amendment 2) Subpart H engines and CRI-T-01 and batteries according to DO-311 A.

Easy to check:

- motor
- controller
- batteries
- status of the coolant

Advanced MFD

The 5.7 inch LCD cockpit display presents the state of the electric propulsion system, using intuitive graphics to display all relevant parameters.
VELIS Electro
10.71m (35’1” ft) wingspan

Technical data

**Engine**
- engine type: Pipistrel E-811 EASA Type-Certified
- max power: 57.6 kW MTOP

**Propeller**
- Pipistrel P-812-164-F3A Certified fixed-pitch composite three-blade, 164 m diameter

**Dimensions**
- wing span: 10.71 m (35’1”)
- length: 6.47 m (21’3”)
- height: 1.90 m (6’3”)
- wing area: 9.31 m² (102.4 sqft)
- aspect ratio: 12.04
- positive flaps: 0° (0), 8° (1), 19° (2)
- centre of gravity: 24% - 32.4% MAC

**Weights**
- basic empty weight - with batteries: 426 kg (941 lbs)
- max take-off weight (MTOW): 600 kg (1320 lbs)
- Payload: 172 kg (378 lbs)

**Performance**
*Data published for 600 kg MTOW (1320 lbs) All speeds in Knots*
- stall speed with flaps: 45 KCAS
- stall speed without flaps: 51 KCAS
- cruising speed (35 kW): 90 KCAS
- maximum horizontal speed at sea level: 98 KCAS
- VNE: 108 KCAS
- max speed with flaps (+2): 65 KIAS
- maneuvering speed: 100 KIAS
- best climb speed: 75 KIAS
- max climb rate: 3.3 m/s (647 fpm)
- best glide ratio speed: 64 KIAS
- best glide ratio: 150
- take-off run - grass/asphalt: 246/241 m (807/791 ft)
- take-off over 50’ obstacle - grass/asphalt: 423/429 m (1386/1342 ft)
- service ceiling: 3.660 m (12,000 ft)
- endurance: up to 50 minutes [plus VR reserve]
- max load factor permitted @ (1.975): 4g ~ 2g
- design safety factors & tested: minimum 1.875

Note: Data is for ISA sea-level conditions. Pipistrel reserves the right to revise this data sheet whenever occasioned by product improvement, government/authority regulations or other good cause.

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