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SDO 50 V2

Product presentation

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Aerial surveillance:

UAVs equipped with video or infrared cameras, heat, radiation & multispectral sensors or radar to provide airborne information to decision makers on the ground or to gather raw data for further processing and analysis.

Search and rescue:

Payloads such as high-end cameras and professional sensors to locate missing people, animals or objects in inaccessible or hazardous areas (land or water), including in difficult weather conditions. Once target persons/animals and objects are located, emergency gear can be airlifted and dropped to support their recovery and rescue (e.g. survival kits, medical devices, food, rafts) or valuable tactical data of objects is retrieved.

Inspections:

The aerial unmanned platform is integrated with a variety of gimbal cameras, such as hyper and multispectral imaging and LiDAR laser scanning for aerial infrastructure and asset inspections in critical, remote conditions and/or with the need for longer endurance and heavier payloads.

Applications

Aerial Surveillance:

Aerial surveillance will give you unparalleled flexibility compared to traditional intelligence methods. Most of current operations are limited by the stationary nature of the observer or camera. Earlier aerial surveillance methods using helicopters deemed expensive. The SDO 50 V2 with its class-leading payload capability allows the user to choose the best camera system for the mission. Higher payload capacity means you will be able to carry multiple sensors and/or offer a much longer endurance.

A key advantage of the SDO 50 V2 is its ability to collect imagery, ideally suited for reconnaissance or rapid situation awareness, for decision-makers to detect, monitor and act upon potential threats from a safe distance.

Search and Rescue:

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Search & Rescue refers to using UAVs equipped with specific equipment to locate and help missing people, animals or objects in inaccessible or hazardous areas (land or water), including in difficult weather conditions. Once target persons/animals are located, emergency gear can be airlifted and dropped to support their recovery and rescue (e.g. survival kits, medical devices, food, rafts) or valuable tactical data of objects is retrieved.

The SDO 50 V2 is also capable of providing real-time visual information and data for better situational awareness in the aftermath of an earthquake, hurricane or other natural disasters.

Inspections:

Regular inspections of critical infrastructure, such as high-voltage power lines, gas and oil pipelines and power plants are imperative for their uninterrupted operation and security. Downtime of infrastructure is costly and inspection/maintenance operations can often be dangerous to personnel. In the recent years UAVs have proven to be invaluable in these operations.

The SDO 50 V2 can also conduct topographic surveys to asses site feasibility and offer in-depth information of environmental risks while being equipped with top of the range LiDAR, hyperspectral, multispectral or high definition camera modules.

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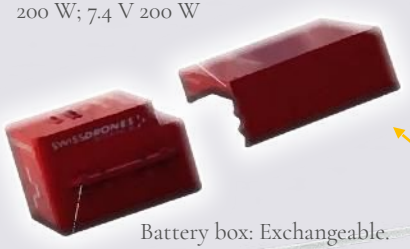
Differentials

- Missions are possible under difficult or dangerous circumstances (e.g. bad weather, darkness, flying over hostile or otherwise unsafe areas) when manned operations are not feasible
- Cost effective compared to a manned IFR/night VFR airborne solution
- Flight duration up to 2-3 hours and range up to 40 km (extendable)
- Vertical takeoff and landing (VTOL) capability of drone
- Feasible for covered operations due to low noise emission compared to manned systems
- Emergency gear can be airlifted to inaccessible/hazardous places
- System is ground transportable to venue of mission by means of a van or pick-up
- Less skilled operating force required compared to manned systems

Product details

Intermeshing rotor system with proprietary SwissDrones design; High-performing payload ratio; only UAV in the market carrying more than its own weight.

Fully integrated avionics: Output power 28 V 200 W; 12 V 200 W; 7.4 V 200 W

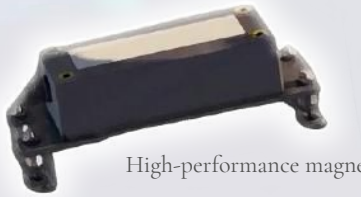


Battery box: Exchangeable.

Auxiliary fuel tanks:
Optional 2 x 4 liters or 2 x 8 liters.

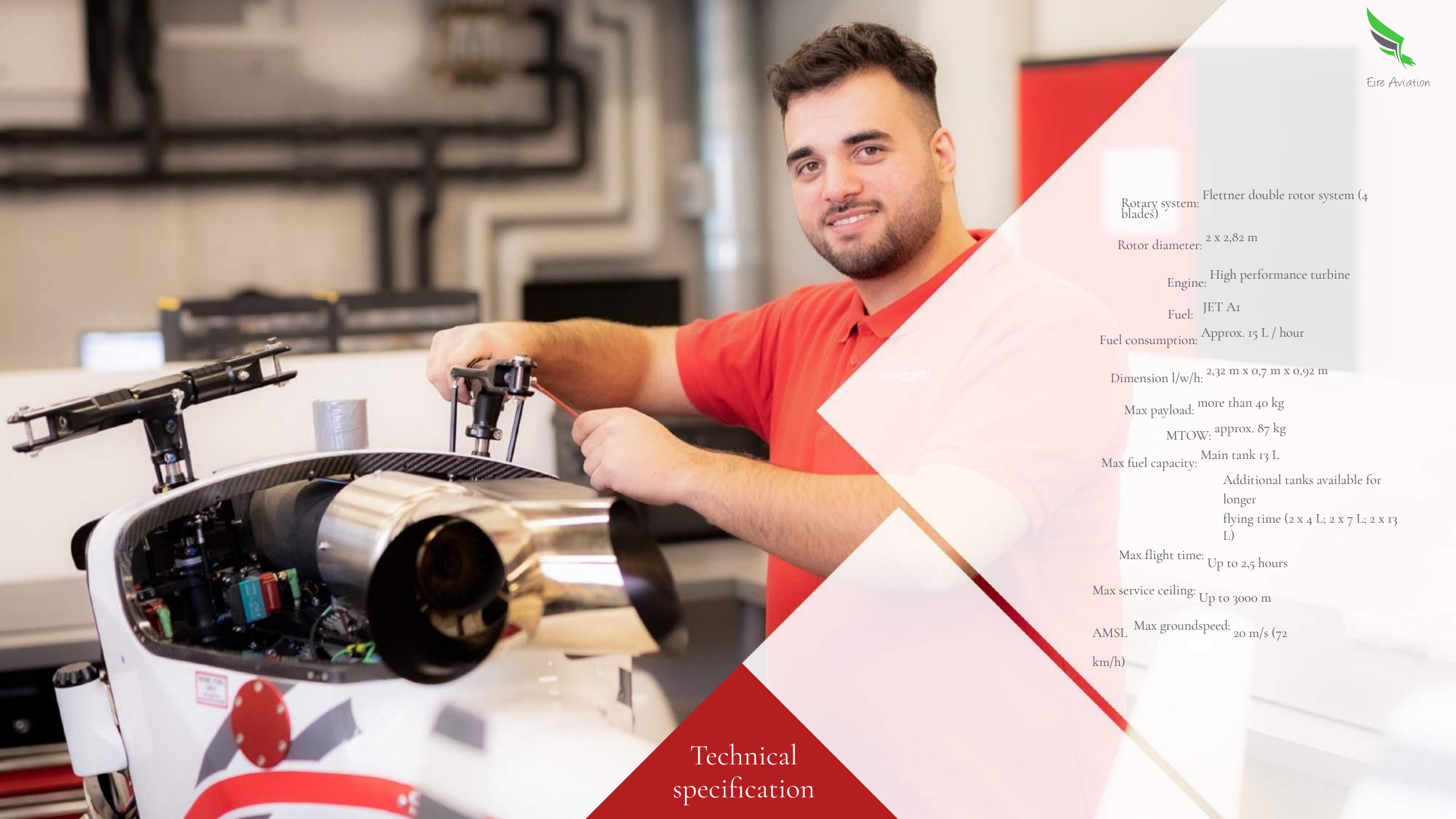
High performance jet turbine:
Runs on Jet A1; 11 kW power.

Main auxiliary fuel tank with 13 liters.



High-performance magnetometer.

High-precision GPS receiver.



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Technical specification

Rotary system:	Flettner double rotor system (4 blades)
Rotor diameter:	2 x 2,82 m
Engine:	High performance turbine
Fuel:	JET A1
Fuel consumption:	Approx. 15 L / hour
Dimension l/w/h:	2,32 m x 0,7 m x 0,92 m
Max payload:	more than 40 kg
MTOW:	approx. 87 kg
Max fuel capacity:	Main tank 13 L Additional tanks available for longer flying time (2 x 4 L; 2 x 7 L; 2 x 13 L)
Max flight time:	Up to 2,5 hours
Max service ceiling:	Up to 3000 m AMSL
Max groundspeed:	20 m/s (72 km/h)

Flettner design

The SDO 50 V2 uses a proprietary design of the (Anton) Flettner principles of intermeshing double rotor systems (used in their axes in a low angle tilted against each other) allowing for significantly higher payloads and flight stability than conventional systems.

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Mobile:
15min set-up by 2 man crew, transported by van or pick-up.

Stationary:
Fix installation at strategic location.

Maritime:
Take-off and landing on a moving ship.

Hybrid:
Combination of deployment with other fast-response mechanisms such as helicopters.

Operations and Mission Deployment

The SDO 50 V2 system can be operated as a fix installation, as part of a ship operation, be made ground transportable to the venue of mission by means of a van or pick-up or be deployed in combination with helicopters.

The SDO 50 V2 will offer an integrated ship landing and deck finder system for mobile maritime operations for aerial surveillance and search and rescue.

- No requirement for specialized infrastructure
- Proven integration into ship command system
- Two-man operation
- Small equipment footprint

Ship integration

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Weather conditions

The SDO 50 V2 is made for missions in critical conditions, such as windy, rainy, snowy weather conditions, day and night, at high altitude and a large spectrum of temperatures.

Temperature range:

Min. -10 °C / Max +40 °C

Weather:

Light rain and snow

Wind:

Max. resistance: 20 Knots

Altitude:

Max. up to 3,000 m AMSL

Darkness:

Can operate in conditions when manned helicopters show limitations.

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Payloads

Additional payloads can be integrated upon request.

Octupus ISR system
UAV Factory: Epsilon 175

LiDAR
RIEGL VUX

Hyper-spectral
Specim AisaKESTREL

Gas leaks
Pergam: Alma G4 mini

Radioactive particle detection
NAS

Multi-spectral
Leica: RCD30

Ground control station

Mission and payload control

Data link / GPS
Terrestrial radio link

Control pilot interface

1. Bottom front panel (Base unit)
2. Ventilation grid
3. Cooling fan
4. USB 3.0 connector (2x)
5. Free socket
6. Main power “on / off“
7. System test power “on”
8. System monitor (Touch screen)
9. Payload key switch 1
10. Payload key switch 2
11. Payload key switch 3
12. Payload push button 1

13. Payload push button 2
14. Payload analog 1
15. Payload analog 2
16. Monitor “on / off”
17. Monitor “menu”
18. Monitor “menu selection”
19. Monitor “enter”
20. 8.4” monitor
21. Engine control switch
22. Flight control “auto take off”
23. light control “auto landing”
24. Flight control “manual mode”

SwissDrones provides a state-of-the art ground control station unit and a high-end autopilot, equipped with professional sensors and redundant systems (optional).

25 - Flight control “start mission”
26 - Flight control “return to home”
27 - Flight control “position hold”
28 - 3-axis-stick (e.g. payload)
29 - 3-axis-stick (flight control)
30 - 1-axis control wheel (payload)

31 - 1-axis control wheel (flight)
32 - Keyboard illumination
33 - Mouse with left and right button
34 - 1-axis control wheel (payload)
35 - Lifting knobs for service
36 - Connecting tube to cover

Ground control station

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Maintenance cycle:

Turbine check	Engine	Every 50 hrs
Turbine pump replacement	Engine	Every 500 hrs
PEEK gear replacement	Mechanical	Every 100 hrs
Gear oil replacement	Mechanical	Every 100 hrs
Actuator replacement	Mechanical	Every 250 hrs
Generator and belt replacement	Mechanical	Every 250 hrs
Avionic box inspection	Electronics	Every 250 hrs
Avionic/ECU batteries replacement	Electrical	Every 250 hrs
SDO-50V2 overhaul at SDO facility	Mechanical	Every 500 hrs
Rotor blades replacement	External	Every 500 hrs
Turbine replacement	Engine	Every 500 hrs

Maintenance Concept

Data link architecture

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Made for superior endurance in critical unmanned aerial applications.