GOING FURTHER
GOING SAFER
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FACTSHEET
REALIBILITY

GOING FURTHER
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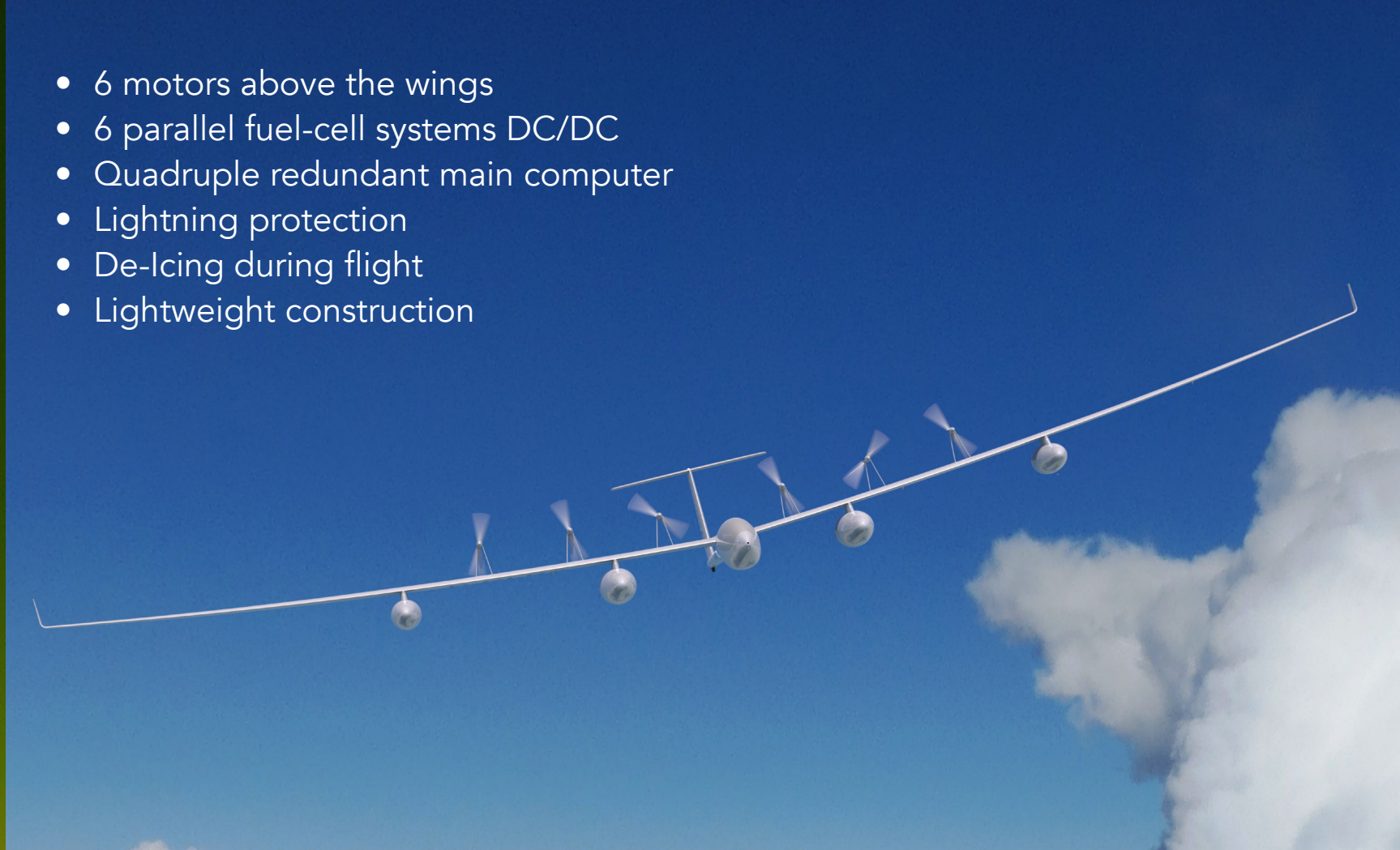
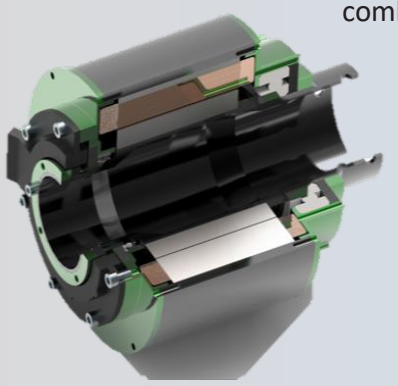
- 6 motors above the wings
- 6 parallel fuel-cell systems DC/DC
- Quadruple redundant main computer
- Lightning protection
- De-Icing during flight
- Lightweight construction



Facts & Figures Reliability

Electric propulsion systems are inherently more reliable than their combustion based equivalents. They contain a minimum of moving parts and the required system complexities have been shifted from the mechanical field to semiconductor circuits and software algorithms.



Because there are no reciprocating pistons or drive shafts rotating at extreme speeds, the vibrational stresses experienced by both the electric drive system and the surrounding airframe are substantially reduced.

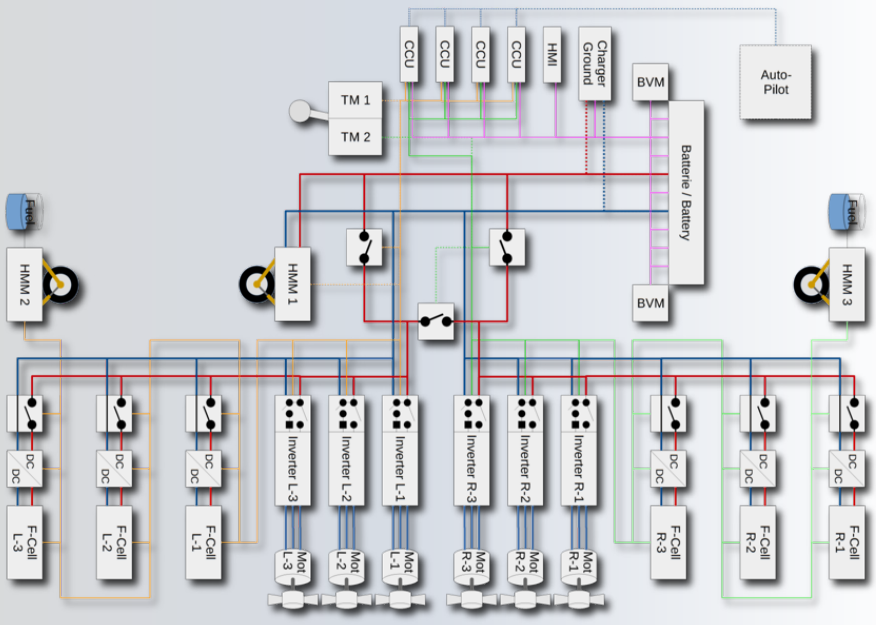
Reliability

In addition, state-of-the-art electric motors and motor controls are extremely efficient. This means that they produce very little waste heat. Compared to fuel systems, fuel cells are also much more efficient and operate at much lower temperatures.

The lower level of vibration and the higher efficiency of the machine lead to the conclusion that the Antares E2 has to cope with much lower thermal loads than comparable systems at combustion level. Lower vibration and heat loads directly affect the reliability of the system.

Redundancy

The consistently redundant design of all components is a key feature of the Antares E2. Starting with the high reliability of the electric powertrain, combined with a high degree of redundancy for all key elements of the system, a fail-safe system results.



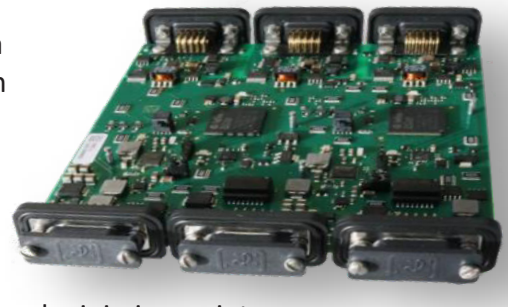
Engines: Only two of the six electric propellers are needed for the stable, long-lasting Antares E2 flight in the event of a crisis.

Power Supply: The Antares E2 is powered by both a lithium ion battery and six parallel fuel cell systems. The aircraft-tested battery system has approximately 250,000 operating hours in various Lange aircraft.

Fuel cell system: In the event of a crisis, the system can tolerate the failure of two fuel cells at the same time without impairing long-term flight.

Computing and Communication: Integrated circuits are very good for redundancy. All safety-critical electronic components are redundant in the Antares E2. The central processing unit uses highly reliable automotive electronics and a quadruple parallel cascade redundancy system.

The various components of the system communicate with each other via subdivided data buses, each bus having its own triplex redundancy.



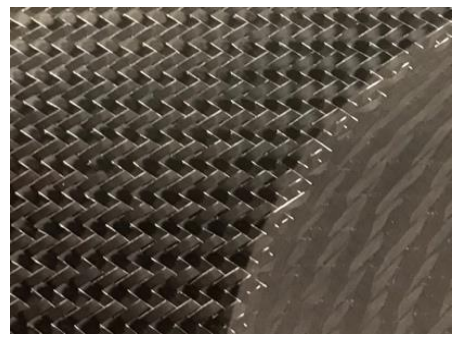
Robustness

All components have a rugged design to ensure safety and minimize maintenance.

- To avoid corrosive problems when operating in harsh environments, the electric motors are completely sealed and require only passive surface cooling. The only moving component is the drive shaft with the propeller.
- The space-saving Li-Ion cells are fully sealed and can operate safely in the harsh vacuum of space. As a result, the battery of the Antares E2 is not affected by the effects of air pressure fluctuations.
- The multi-redundant battery management system ensures that all other parameters for safe battery operation are maintained.
- Error detection algorithms (including real-time simulation and plausibility check) are used to automatically identify and isolate any component errors.

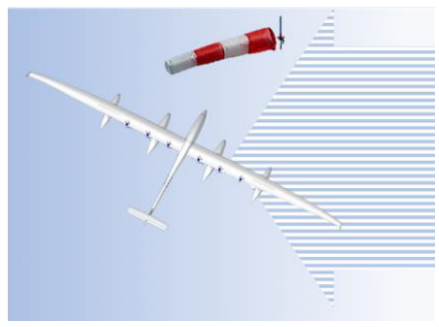
High modulus fiber and lightning protection

The fuselage shells and the wings are made of a special high-modulus carbon fiber with higher strength properties. The use of the high-modulus fiber brings with lower mass a higher rigidity of the components which compensates for aeroelastic effects (vibrations). A lightning protection is incorporated into the complete shell to protect the electrical components. Lightning protection is typical and necessary for aircraft of this class.



Weather as challenge

Very high system reliability would only be of limited benefit to an aircraft of this class if poor weather conditions can prevent the aircraft from reliably performing its mission.



The range and stamina of the Antares E2, as well as its potential use over open sea and wilderness, require the aircraft to withstand adverse weather conditions.

The range and duration of the Antares E2 exceed the accuracy window of the weather forecasts so that the weather conditions of a 40-hour mission are not exactly predictable. A mission can also include several climatic zones, so that "all-weather ability" is necessary.

De-Icing

Furthermore, the Antares E2 has an ‘de-icing system, which prevents the accumulation of ice on the aircraft. Compared to most smaller UAVs, the tolerable wind speeds are significantly higher, especially taking into account wind conditions and turbulence during takeoff and landing.

GAME-CHANGING TECHNOLOGY

The Antares E2 uses a state of the art electric drivetrain consisting of fuel cells and electric motors with multiple redundancy. This yields a combination of high endurance and high reliability which means that expensive sensor-payloads can safely be carried further and longer.
Built-in capabilities for rough weather combined with the possibility of flying both manned and unmanned applications gives the aircraft a high degree of mission readiness exibility. The payload carrying capability of the Antares E2 allows the installation of a comprehensive set of sensors and communication systems, making the system well suited for a wide variety of applications.

ANTARES E2 - A GAME-CHANGER IN REMOTE SENSING.

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