
Type Acceptance Report

TAR 11/21B/4

LANGE E1 ANTARES

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Executive Summary

New Zealand Type Acceptance has been granted to the Lange E1 Antares based on validation of EASA Type Certificate number A.092. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Appendix 1, which are now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with NZCAR §21.191, subject to any outstanding New Zealand operational requirements being met (see Section 5 of this report for a review of compliance of the basic type design with the operating Rules). Additional variants or serial numbers approved under the foreign type certificate can become type accepted after supply of the applicable documentation, in accordance with the provisions of NZCAR §21.43(c).

NOTE: The information in this report is correct as at the date of issue. The report is only updated when an application is received to revise the Type Acceptance Certificate. For details on the current type certificate holder and any specific technical data, refer to the latest State-of-Design Type Certificate Data Sheet.

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 11/21B/4 was granted in the Standard Category in accordance with NZCAR Part 21 Subpart B.

Specifically the report aims to:

- (a) Specify the foreign type certificate and associated airworthiness design standard used for type acceptance of the model(s) in New Zealand; and
- (b) Identify any special conditions for import applicable to any model(s) covered by the Type Acceptance Certificate; and
- (c) Identify any additional requirements which must be complied with prior to the issue of a NZ Airworthiness Certificate or for any subsequent operations.

2. State-of-Design Type Certificate Details

Manufacturer:	Lange Aviation GmbH (since 25 Jan. 2016, previously Lange Flugzeugbau GmbH)
Type Certificate:	A.092
Issued by:	European Aviation Safety Agency
Model(s):	E1 Antares
MCTOW	660 kg (with water ballast) 602 kg (without)

Max. No. of Seats: 1

Noise Standard: ICAO Annex 16, Volume 1, Chapter 10

Engine: Lange EA 42

Type Certificate: E.015

Issued by: European Aviation Safety Agency

Propeller: Lange LF-P42

Type Certificate: P.015

Issued by: European Aviation Safety Agency

3. Type Acceptance Details

The application for New Zealand type acceptance was from the importer, Mr Julian Elder, dated 16 July 2010. The first-of-type example was serial no. 32E30, registered ZK-GDE. The E1 Antares is a composite single-seat self-launching powered glider with an electric motor and composite two-blade fixed-pitch two metre diameter propeller.

Type Acceptance Certificate No. 11/21B/4 was granted on 12 April 2016 to the Model E1 Antares based on validation of EASA Type Certificate A.092, and includes the EA 42 engine based on EASA Type Certificate E.015 and the LF-P42 propeller based on EASA Type Certificate P.015. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

The E1 Antares (also known as the “Antares 20E”) is an all new design with a shoulder-mounted 20 metre span wing with flaperons and winglets. The aircraft is constructed from CRP/GRP-composites, with a T-shaped horizontal tailplane with fin and elevator, Schempp-Hirth airbrakes on the upper wing, and wing water ballast tanks. The retractable landing gear is equipped with brake and spring suspension. The EA 42 electric drive system consists of the electric motor EM42, power-electronics LE42, engine control system EDCS2 and the sensor, data and power cables. The 42kW brushless DC electric motor is powered by a SAFT lithium-ion battery system, spilt into two packs positioned in the leading edge of both wings.

4. NZCAR §21.43 Data Requirements

The type data requirements of NZCAR Part 21B Para §21.43 have been satisfied by supply of the following documents, or were already held by the CAA:

(1) State-of-Design Type certificate:

EASA Type Certificate Number A.092

EASA Type Certificate Data Sheet number A.092 at Issue 02 dated 25 Jan. 2016
– Model E1 Antares approved 14 July 2006.

EASA Type Certificate Number E.015

EASA Type Certificate Data Sheet number E.015 at Issue 02 dated 02 Dec. 2014
– Model EA 42 engine approved 31 January 2006.

EASA Type Certificate Number P.015

EASA Type Certificate Data Sheet number P.015 at Issue 02 dated 02 Dec. 2006
– Model LF-P42 propeller approved 31 January 2006.

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the E1 Antares is Joint Airworthiness Requirements for Sailplanes and Powered Sailplanes (JAR 22) at Change 6, dated August 2001, plus the Preliminary Standards for Structural Substantiation of Glass and Carbon Fibre Reinforced Plastic Components for Sailplanes and Powered Sailplanes, July 1991. This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, as JAR 22 is the basic standard for sailplanes and powered sailplanes called up under Part 21 Appendix C and Advisory Circular 21-1. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23.

(ii) *Special Conditions:*

Special Condition for the installation of electrical power in powered sailplanes, issued 24 April 1998 – this covers the powerplant certification requirements of the electric motor and battery as part of the type certification of the aircraft.

Special Condition for the substantiation of the electrical system of powered sailplanes, I 334-MS 92, issued 15 September 1992 – this special condition is applied to a variety of LBA-approved powered sailplanes and covers the requirements of the electrical equipment. It is not related to the electrical powerplant.

(iii) *Equivalent Level of Safety Findings:*

Nil.

- (iv) *Airworthiness Limitations:*
Section 3 of the Maintenance Manual for the E1 Antares Motorglider. The airframe has a specified service life of 12,000 hours, and requires special inspections at set intervals to reach it.
- (3) Aircraft Noise and Engine Emission Standards:
- (i) *Environmental Standard:*
ICAO Annex 16, Volume I, Chapter 10.
- (ii) *Compliance Listing:*
See EASA Type Certificate Data Sheet for Noise number A.092 at Issue 02 dated 25 January 2016.
- (4) Certification Compliance Listing:
Lange Fluzeugbau Nachweisliste Musterzulassung – Compliance Checklist E1-Antares, dated 30 June 2006.
- (5) Flight Manual: Flight Manual for the E1 Antares Powered Sailplane, issued 01 December 2004, LBA-approved. CAA Accepted as AIR 3311.
- (6) Operating Data for Aircraft, Engine and Propeller:
- (i) *Maintenance Manual:*
Maintenance Manual for the E1 Antares Motorglider, dated 22 June 2006.
Operating Manual for the Electric Drive EA 42, dated 12 Aug. 2005.
Operating Manual for the Propeller LF-P42, dated 23 Aug. 2005.
- (ii) *Current service Information:*
Lange Aviation GmbH Technical Notes.
- (iii) *Illustrated Parts Catalogue:*
None produced.
- (7) Agreement from manufacturer to supply updates of data in (5), and (6):
CAA 2171 signed by Axel Lange, CEO of Lange Aviation GmbH dated 09 April 2015.

5. Additional New Zealand Requirements

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 has been assessed as they are a prerequisite for the grant of an airworthiness certificate.

Civil Aviation Rules Part 26

Subpart B – Additional Airworthiness Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
B.1	Marking of Doors and Emergency Exits	<i>To be determined on an individual aircraft basis</i>
B.2	Crew Protection Requirements – CAM 8 Appdx. B # .35	Not Applicable – Agricultural Aircraft only

Compliance with the following additional NZ operating requirements has been reviewed and were found to be covered by either the original certification requirements or the basic build standard of the aircraft, except as noted:

Civil Aviation Rules Part 91

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Seating and Restraints – Safety belt/Shoulder Harness	4-Point harness required equipment – See TCDS Min. Eqpt.
91.507	Pax Information Signs – Smoking, safety belts fastened	Not Applicable – 10 seats or more only
91.509	Minimum Instruments and Equipment VFR	Not Applicable – Powered aircraft only
91.511	Minimum Instruments and Equipment Night VFR	Not Applicable – Certificated for Day VFR flight only
91.513	VFR Communication Equipment	<i>Operational requirement – compliance as applicable</i>
91.517	Minimum Instruments and Equipment IFR	Not Applicable – Certificated for Day VFR flight only
91.519	IFR Communication and Navigation Equipment	Not Applicable – Certificated for Day VFR flight only
91.523	Emergency Equipment	N/A – Single-seat glider [Superseded by §104.101(5)]
91.529	ELT - TSO C126 406 MHz after 22/11/2007	<i>Operational requirement – compliance as applicable</i>
91.531	Oxygen Indicators - Volume/Pressure/Delivery	<i>Operational requirement – compliance as applicable</i>
91.533	Oxygen for Non-Pressurised Aircraft (required for >30 min above FL100)	<i>Operational requirement – compliance as applicable</i>
91.541	SSR Transponder and Altitude Reporting Equipment	<i>Operational requirement – compliance as applicable</i>
91.543	Altitude Alerting Device - Turbojet or Turbofan	Not Applicable
91.545	Assigned Altitude Indicator	Not Applicable – Certificated for Day VFR flight only
A.15	ELT Installation Requirements	<i>To be determined on an individual aircraft basis</i>

Civil Aviation Rules Part 104

Subpart C – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
104.101	(1) Airspeed Indicator (2) Altimeter (Adjustable for barometric pressure) (3) Magnetic Compass (4) Safety Harness for each seat (5) A First Aid Kit (6) For powered gliders (7) For IMC - (i) A variometer (ii) Turn & Slip/Artificial Horizon (iii) Radio transceiver	Required as Minimum Equipment – See TCDS Minimum Equipment Required as Minimum Equipment – See TCDS Minimum Equipment <i>To be determined on an individual aircraft basis</i> Required as Minimum Equipment – See TCDS Minimum Equipment <i>To be determined on an individual aircraft basis</i> Not Applicable <i>Operational requirement – compliance as applicable</i>

NOTES: 1. A Design Rule reference in the Means of Compliance column indicates the Design Rule was exactly equivalent to the CAR requirement, and compliance is achieved for the basic aircraft type design by certification against the original Design Rule.

2. The CAR Compliance Tables above were correct at the time of issue of the Type Acceptance Report. The Rules may have changed since that date and should be checked individually.

3. Some means of compliance above are specific to a particular model/configuration. Compliance with Part 91/119 operating requirements should be checked in each case, particularly oxygen system capacity and emergency equipment.

Attachments

The following documents form attachments to this report:

- Three-view drawing of Lange E1 Antares
- Copy of EASA Type Certificate Data Sheet Number A.092
- Copy of EASA Type Certificate Data Sheet Number E.015
- Copy of EASA Type Certificate Data Sheet Number P.015

Sign off

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Jason Ashworth
Airworthiness Engineer

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Checked – David Gill
Team Leader Airworthiness

Appendix 1

List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
E1 Antares	Lange Aviation GmbH	11/21B4	12 April 2016