
Type Acceptance Report

TAR 23/21B/2

Schempp-Hirth Ventus-3F

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Executive Summary

New Zealand Type Acceptance has been granted to the powered versions of the Schempp-Hirth Ventus-3 Series based on validation of Type Certificate number EASA.A.627. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Section 2, 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 was correct as at the date of issue. The report is generally 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 revision of the State-of-Design Type Certificate Data Sheet referenced herein.

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 23/21B/2 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.

The report notes the status of all models included under the State-of-Design type certificate which have been granted type acceptance in New Zealand, which are listed in Section 2. The history of type acceptance of powered versions of the Schempp-Hirth Ventus-3 series under type certificate EASA.A.627 is listed in Appendix 1.

2. Aircraft Certification Details

(a) State-of-Design Type and Production Certificates:

Manufacturer: Schempp-Hirth Flugzeugbau GmbH
Type Certificate: EASA.A.627
Issued by: European Union Aviation Safety Agency
Production Approval: DE.21G.002

(c) Models Covered by the Part 21B Type Acceptance Certificate:

(i) **Model:** Ventus-3F
MCTOW: 600 kg (1320 lb.) – 18m span
Max. No. of Seats: 1
Noise Standard: ICAO Annex 16, Volume 1
Engine: FES-VEN-M100
Type Certificate: Not Applicable (engine accepted as part of the aircraft)
Propeller: FES-VEN-P1-102
Type Certificate: Not Applicable (propeller accepted as part of the aircraft)

3. Application Details and Background Information

The application for New Zealand type acceptance of the Schempp-Hirth Ventus-3F was from Sailplane Services 2005 Limited, dated 27 July 2022. The first-of-type (pre-certification) example was serial number 038FS, registered ZK-GSR. The Ventus-3 is a single-seat all composite glider with flaps, airbrakes, retractable undercarriage and T-tail, with provision for water ballast and intended for the FAI 18m competition class.

Type Acceptance Certificate No. 23/21B/2 was granted on 4 October 2022 to the Schempp-Hirth Ventus-3F based on validation of type certificate number EASA.A.627. Specific applicability is limited to the coverage provided by the supplied operating documentation. There are no special requirements for import into New Zealand.

The Ventus-3F is the powered version of the Ventus-3 with the nose-mounted 30hp electric-powerplant package (FES – Front Electric Sustainer) produced by LZ-Design in Slovenia. This uses a brushless DC synchronous permanent magnet electric motor, with an electronic controller mounted on top of the main wheel box. A one-meter-diameter carbon fibre propeller extends centrifugally when the motor is operating, or folds flat against the nose when not in use. Both were approved as part of the aircraft, because they do not have type certificates. Under EASA Part 21.A.23(b)(2) this is permitted when the engine and propeller are shown to be in compliance with the certification specifications necessary to ensure safe flight of the aircraft. Under EASA policy the use of non-type certificated products is limited to ELA1, and such aircraft were originally only eligible for a Restricted Category airworthiness certificate. EASA has since changed the policy to allow issue in the Standard Category. At the present time only the Sport Variant (with side-opening canopy) has been certified.

The first examples of the Ventus-3F in New Zealand were pre-production aircraft which were permitted to operate temporarily in the Special Category. After type certification these were checked against a type data check list (Musterstandsliste) sent by the manufacturer to the local agent, after which an EASA-Form 52 was issued.

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 EASA.A.627

Type Certificate Data Sheet number EASA.A.627 at Issue 06 dated 22 July 2022
– Model Ventus-3F approved 8 June 2022

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the Ventus-3F is the Certification Specifications for Sailplanes and Powered Sailplanes CS 22, Amend. 2, effective March 5, 2009.

This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, as CS-22 is the successor of JAR-22, which is the basic standard for powered sailplanes called up under Advisory Circular 21-2. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23. The Ventus-3 powered glider series is approved for Day-VFR operations, while cloud flying is permitted with some limitations.

(ii) *Special Conditions:*

SC.22-2014-01 Installation of Electric Propulsion in Sailplanes – CRI E-101 specified a detailed set of additional safety requirements for electric propulsion systems using rechargeable (Li-Po) batteries as an energy storage device. These have specific failure and operational characteristics that could affect the safety of those installations and cause hazards to safety. These requirements were added under the CS22 individual paragraph headings.

SC E-01 Airworthiness Standard for CS-22H Electrical Retractable Engine to be operated in Powered Sailplanes – In accordance with article 11 of EC 2018/1139 no separate type certificate is required for engines and propellers that have been certified as part of an aircraft. CRI H-101 defined the certification specifications as part of a CS-22 sailplane. Again these were presented as additions to the CS22 individual paragraph headings.

(iii) *Equivalent Level of Safety Findings:*

CS 22.207 (c)(1) – Stall warning: It is quite common for utility category gliders that positive flap settings are operated close to the stall e.g. for circling in thermals. A stall warning in those circumstances becomes a nuisance, so it must not begin too early. For the Ventus-3F the onset of the stall warning by the SWS at zero or positive flap setting occurs at a speed higher than 1.1 V_{si}. This was accepted because IAS values drop quickly to lower values and give the pilot very good information about the impending stall.

CS 22.335 (f) – An alternative method to derive V_D was used based on the LBA report “Concerning the deduction of design maximum speed V_D in the airworthiness requirements LFS, LFSM, OSTIVAS and JAR 22”, which equated maximum dive speed to be that where the glider sink rate in the flight polar was a specified 7.8125 m/s.

(iv) *Airworthiness Limitations:*

See the Flight Manual Section 2.14 for airframe lifetime limitations

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

Under EASA the powered Ventus-3F conforms with the provisions of Article 6.1 of Regulation 216/2008 without having to comply with the Standards of ICAO Annex 16, Volume I, Chapter 10, as a self-sustaining powered sailplane.

(ii) *Compliance Listing:*

TCDS for Noise TCDSN.A.627 at Issue 2 dated 22 July 2022

(4) Certification Compliance Listing:

Nachweisliste (Mz) / Compliance Checklist Variant Ventus-3F

CRI A-1 – EASA Type Certification Basis – Ventus-3F

(5) Flight Manual: EASA-Approved Flight Manual for Powered Sailplane Ventus-3F
CAA Accepted as AIR 3497

(6) Operating Data for Aircraft:

(i) *Maintenance Manual:*

Maintenance Manual for Electric Powered Sailplane Ventus-3F

Repair Manual for the GFRP/CFRP Powered Sailplane Model “Ventus-3F”

(ii) *Current service Information:*

Summary of Schempp-Hirth Modification Bulletins – Ventus-3 / Ventus-3M

Summary of Technical Notes and Airworthiness Directives – Ventus-3

(iii) *Illustrated Parts Catalogue:*

Not produced

(7) Agreement from manufacturer to supply updates of data in (5), and (6):

CAA 2171 signed by Schempp-Hirth Head of Technical Office dated 05.08.2022

(8) Other information:

Nil

5. New Zealand Operational Rule Compliance

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.

CAR Part 26 – Subpart B – Additional Airworthiness Requirements

Appendix B – All Aircraft

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 Appendix. 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:

CAR Part 91 – Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Shoulder Harness if Aerobatic; >10 pax; Flight Training	Four-piece seatbelt harness fitted – See Flight Manual §7.5
91.507	Pax Information Signs – Smoking, safety belts fastened	Not Applicable – Single-seat glider
91.509	Minimum Instruments and Equipment	Not Applicable – Powered aircraft only
91.511	Night VFR Instruments and Equipment	Not Applicable – Certificated for Day VFR flight only
91.513	VFR Communication Equipment	<i>Operational requirement – compliance as applicable</i>
91.517	IFR Instruments and Equipment	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 C91a after 1/4/97 (or replacement)	<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	<i>Operational requirement – compliance as applicable</i>
	[Installation instructions for the oxygen cylinder must be requested from the manufacturer – See FM §7.14]	
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 – Certificated for Day VFR flight only
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>

CAR Part 104 – Subpart C – Equipment and Maintenance Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
104.101	(1) Airspeed Indicator (2) Altimeter (Adjustable barometric pressure) (3) Magnetic Compass (4) Safety Harness for each seat (5) A First Aid Kit (6) For powered gliders – (i) Fuel gauge for each main fuel tank (ii) Oil Pressure Gauge or warning device (iii) A tachometer or engine governor light (7) For IMC flight – (i) A variometer (ii) Turn & Slip/Artificial Horizon (iii) Radio transceiver	Required as Minimum Equipment – See TCDS Section #III.3 Required as Minimum Equipment – See TCDS Section #III.3 Required as Minimum Equipment – See TCDS Section #III.3 Required as Minimum Equipment – See TCDS Section #III.3 <i>Operational requirement – compliance as applicable</i> Required as Minimum Equipment – See TCDS Section #III.3 Not Applicable – Electric motor Required as Minimum Equipment – See TCDS Section #III.3 } This equipment must be fitted if the sailplane is used for cloud } flying [See Flight Manual Section 2.12.2] }

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

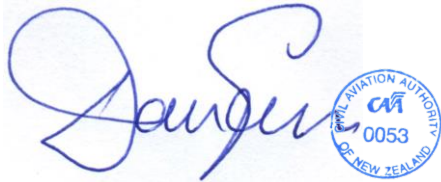
2. The CAR Compliance Tables above were correct at the time of issue of the Type Acceptance Report. The Rules may have changed since that date and should be checked individually.

Attachments

The following documents form attachments to this report:

Copy of EASA Type Certificate Data Sheet Number EASA.A.627

Sign off

A blue ink signature of David Gill is written over a circular blue seal of the Civil Aviation Authority of New Zealand. The seal contains the text 'CIVIL AVIATION AUTHORITY OF NEW ZEALAND' and the number '0053'.

.....
David Gill
Team Leader Aircraft Inspection

A blue ink signature of John Marshall is written over a circular blue seal of the Civil Aviation Authority of New Zealand. The seal contains the text 'CIVIL AVIATION AUTHORITY OF NEW ZEALAND' and the number '5816'.

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Checked – John Marshall
Airworthiness Inspector

Appendix 1

List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
Ventus-3F	Sailplane Services 2005 Limited	23/21B/2	4 October 2022

Appendix 2

Three-view drawing Schempp-Hirth Ventus-3F:

