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# **Type Acceptance Report**

**TAR 15/21B/18 – Revision 1**

**HPH GLASFLÜGEL 304 Series**



## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>	<b>1</b>
<b>1. INTRODUCTION</b>	<b>1</b>
<b>2. AIRCRAFT CERTIFICATION DETAILS</b>	<b>2</b>
<b>3. APPLICATION DETAILS AND BACKGROUND INFORMATION</b>	<b>3</b>
<b>4. NZCAR §21.43 DATA REQUIREMENTS</b>	<b>4</b>
<b>5. NEW ZEALAND OPERATIONAL RULE REQUIREMENTS</b>	<b>6</b>
<b>ATTACHMENTS</b>	<b>7</b>
<b>APPENDIX 1</b>	<b>7</b>



## Executive Summary

New Zealand Type Acceptance has been granted to the HPH Glasflügel 304 Series based on validation of EASA Type Certificate number A.030. 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 (or Restricted Category for the 304 eS) in accordance with NZCAR §21.177, 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.15/21B/18 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 covers all models included on the State-of-Design type certificate which have been granted type acceptance in New Zealand. Appendix 1 details which models have been type accepted in accordance with the provisions of CAR Part 21B and which were certificated prior to that under NZCAR Section B.9 and are now type accepted under the transitional arrangements of Part 21 Appendix A(c).

## 2. Aircraft Certification Details

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

Manufacturer: HPH, spol.s r.o.  
Type Certificate: A.030  
Issued by: European Aviation Safety Agency  
Production Approval: CZ.21G.0009

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

(i) **Model:** Glasflügel 304 S

MCTOW: 600 kg [1320 lb.]  
Max. No. of Seats: 1  
Noise Standard: Not applicable

(ii) **Model:** Glasflügel 304 MS

MCTOW: 600 kg [1320 lb.]  
Max. No. of Seats: 1  
Noise Standard: ICAO Annex 16

**Engine:** Solo Type 2625 01  
Type Certificate: EASA.E.218  
Issued by: European Aviation Safety Agency

**Propeller:** KS-1G-152-R 122  
Type Certificate: LBA 32.110/18  
Issued by: European Aviation Safety Agency

(iii) **Model:** Glasflügel 304 eS

MCTOW: 600 kg [1320 lb.]  
Max. No. of Seats: 1  
Noise Standard: Not applicable

**Engine:** FES-HPH-M100

**Propeller:** FES-HPH-P1-102

### 3. Application Details and Background Information

The application for New Zealand type acceptance of the Glasflügel 304 MS was from Mr Graham Johnson, dated 6 March 2015. The first-of-type example was serial no. 035-MS, registered ZK-GCV. The 304 MS is a single-seat mid-wing all-composite racing glider in the FAI 18M flapped class, with T-tail and provision for water ballast in the wings.

Type Acceptance Certificate Number 15/21B/18 was granted on 29 April 2015 to the HPH Glasflügel 304 MS based on validation of EASA Type Certificate number A.030. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

Revision 1 was issued to include the 304 S and 304 eS versions. The application was from G Shaw and P Taylor and the First-of-Type example was Glasflügel 304 eS serial number 079-MS, registered ZK-GST. Type acceptance was granted on 9 April 2018.

The 304S is the latest development of the Model 304, which was the last product of the old Glasflügel company before it ceased operations in 1982. Production was eventually taken up again by HpH, who developed versions with winglets and optional extended wingspan. The 304 S features an all-new wing design with a modified aerofoil section.

The Glasflügel 304 MS is the self-launching powered version. This uses a retractable 53 hp two-stroke Solo 2625 engine equipped with a reduction drive to a two-blade fixed-pitch composite propeller with single-lever control.

The Glasflügel 304 eS is a new version with an electric powerplant system. The brushless synchronous permanent magnet motor with electronically controlled commutation system, and the two-blade foldable fixed pitch composite propeller were both accepted 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-TC'd products is limited to ELA1 aircraft.) In this case those standards are CS22 Subparts H and J, plus Special Conditions defined in CRI-E101. Therefore the 304 eS is only eligible for a Restricted Category airworthiness certificate.

## 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:

(1) State-of-Design Type certificate:

EASA Type Certificate Number A.030

EASA Type Certificate Data Sheet no. A.030 at Issue 05 dated 15 December 2017

– Models Glasflügel 304 S and MS approved 8 December 2014

– Model Glasflügel 304 eS approved 21 November 2016

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the Glasflügel 304 S and MS is JAR 22 at Amendment 7 dated 1<sup>st</sup> September 2003, plus compliance with the Standards for Structural Substantiation of Sailplane and Powered Sailplane Components Consisting of Glass or Carbon Fibre Reinforced Plastics, issued July 1991. For the 304 eS CS 22 Subparts H and J at Amendment 2 dated 5<sup>th</sup> March 2008 were substituted, plus two Special Conditions related to the electrical powerplant system.

This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, as JAR 22 is the basic design standard for Gliders 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. The Glasflügel 304 S, MS, and eS are approved for Day VFR operations.

(ii) *Special Conditions:*

304 eS:

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, under the CS22 individual paragraph headings.

SC E-01; Electrical Engine for Powered Sailplanes – CRI H-101 defined the certification specifications for a non-TC'd engine as part of the aircraft as a self-sustaining sailplane. Again these were presented as additions to the CS22 individual paragraph headings.

(iii) *Equivalent Level of Safety Findings:*

Nil

(iv) *Exemptions:*

Nil

(v) *Airworthiness Limitations:*

See MM Section 4: Airworthiness Limitations

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

ICAO Annex 16 Volume 1, 6th Edition / Amendment 10, Chapter 10 (10.4b)  
(Flight Manual states CS-36 Amdt. 2 and Section G36.101(a) FAR36)



(ii) *Compliance Listing:*

Gross weight 600 kg takeoff noise level is 64.7 dB(A) – see TCDSN EASA.A.030  
(No noise compliance was required for the 304 eS because it is a self-sustaining powered sailplane.)

(4) Certification Compliance Listing:

Means of Compliance Glasflügel 304MS – JAR 22 Subparts A through G  
Means of Compliance List Glasflügel 304eS – EASA project Nr.: 0010036768  
CRI A-1 Glasflügel 304 S FES – Type Certification Basis  
CRI A-2 Glasflügel 304 S FES – Acceptance of Engine and Propeller

(5) Flight Manual: EASA-Approved Flight Manual for the Powered Sailplane  
Glasflügel 304 MS – Document No.: G304MS/AFM – CAA  
Accepted as AIR 3310

EASA-Approved Flight Manual for the Sailplane Glasflügel 304 S  
– Document No.: G304S/AFM – CAA Accepted as AIR 3662

Flight Manual Supplement Glasflügel 304 eS – Document No.:  
G304eS/AFMSupp.

(6) Operating Data for Aircraft, Engine and Propeller:

(i) *Maintenance Manual:*

Technical Description, Operating, Maintenance and Repair Manual for the  
Sailplane Glasflügel 304S – Document No.: 304S/MM

Maintenance Manual Supplement for the Sailplane Glasflügel 304MS – Document  
No.: 304MS/MMSup

FES MOTOR MANUAL – Version 1.21 – Type: FES-HPH-M100

FES PROPELLER MANUAL – Version 1.11 – Type: FES-HPH-P1-102

FES BATTERY PACK GEN2 Manual [with integrated Battery Management  
System] – Version 1.19 – Type: FES GEN2 14S

FES FCU Instrument Manual – Version 1.80 (for FCU software version 3.06) –  
Instrument Type: FES-FCU 57

(ii) *Current service Information:*

Technical Notes Glasflügel 304 MS

Overview of Airworthiness Directives and Service Bulletins HPH Glasflügel 304

(iii) *Illustrated Parts Catalogue:*

Not produced.

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

CAA Form 2171 signed by Pekař Martin, GM, dated 16.1.2018

Manuals/AD/SB are available on the company website at <http://www.hph.cz>

## 5. New Zealand Operational Rule Compliance

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 is a prerequisite for the grant of a type acceptance certificate.

### Civil Aviation Rules 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 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 304 MS aircraft, except as noted:

### Civil Aviation Rules Part 91

#### Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Shoulder Harness if Aerobatic; >10 pax; Flight Training	JAR 22.1307 – Required Equipment – See TCDS §*.III.3
91.507	Pax Information Signs - Smoking, safety belts fastened	Not Applicable – Single-seat glider
91.509	Minimum Instruments and Equipment	Not Applicable – Powered glider (See under Part 104)
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 C126 (406 MHz)	<i>Operational requirement – compliance as applicable</i>
91.531	Oxygen Indicators – Volume/Pressure/Delivery	Optional factory oxygen provisions – See Flight Manual §7.11
91.533	Oxygen for Non-Pressurised Aircraft For flight >30 min above FL100 – Supplemental for crew	<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 – 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>

### Civil Aviation Rules Part 104

#### Subpart C – Equipment and Maintenance 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 – (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>To be determined on an individual aircraft basis</i>  Displayed by (required) MCU HPH304S Engine Control Unit Not Applicable – Two-Stroke engine Displayed by (required) MCU HPH304S Engine Control Unit  [ Not Applicable – Certificated for Day VFR only ] <i>Operational requirement – compliance as applicable</i>

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 then and compliance should be checked individually.

**Attachments**

The following documents form attachments to this report:

- Three-view drawing HPH Model Glasflügel 304 MS
- Copy of EASA Type Certificate Data Sheet number EASA.A.030

**Sign off**

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David Gill  
Team Leader Airworthiness

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Checked – Greg Baum  
Airworthiness Engineer

**Appendix 1**

**List of Type Accepted Variants:**

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
Glasflügel 304 MS	G Johnson	15/21B/18	29 April 2015
Glasflügel 304 S and 304 eS	G Shaw and P Taylor	18/21B/28	9 April 2018