TYPE-CERTIFICATE
DATA SHEET

No. IM.P.125

for

HC-E5 series propellers

Type Certificate Holder

Hartzell Propeller Inc.
One Propeller Place
Piqua, OH 45356-2634
USA

For Models:

HC-E5A-2
HC-E5A-3
HC-E5A-31
HC-E5B-5
HC-E5N-3
HC-E5N-5
HC-E5P-3
TABLE OF CONTENTS

I. General .......................................................................................................................... 4
  1. Type/ Model .................................................................................................................. 4
  2. Type Certificate Holder .............................................................................................. 4
  3. Manufacturer .............................................................................................................. 4
  4. Date of Application ..................................................................................................... 4
  5. EASA Certification Reference Date .......................................................................... 4
  6. EASA Type Certification Date .................................................................................. 4
II. Certification Basis ......................................................................................................... 5
  1. State of Design Authority Certification Basis ......................................................... 5
  2. EASA Certification Basis .......................................................................................... 5
  2.1. Airworthiness Standards ...................................................................................... 5
  2.2. Special Conditions ................................................................................................. 5
  2.3. Equivalent Safety Findings .................................................................................. 5
  2.4. Deviations ............................................................................................................. 5
III. Technical Characteristics ............................................................................................ 6
  1. Type Design Definition .............................................................................................. 6
  2. Description ................................................................................................................ 6
  3. Equipment ................................................................................................................ 6
  4. Dimensions ............................................................................................................... 6
  5. Weight ...................................................................................................................... 6
  6. Hub/ Blade- Combinations ...................................................................................... 6
  7. Control System ......................................................................................................... 6
  8. Adaptation to Engine ............................................................................................... 7
  9. Direction of Rotation ............................................................................................... 7
IV. Operating Limitations .................................................................................................. 8
  1. Approved Installations .............................................................................................. 7
  2. Maximum Take Off Power and Speed ..................................................................... 8
  3. Maximum Continuous Power and Speed ................................................................. 8
  4. Propeller Pitch Angle .............................................................................................. 8
V. Operating and Service Instructions ............................................................................... 9
VI. Notes .......................................................................................................................... 10
SECTION: ADMINISTRATIVE ...................................................................................... 13
I. Acronyms and Abbreviations ...................................................................................... 13
II. Type Certificate Holder Record ................................................................................ 13
III. Change Record ......................................................................................................... 13
I. General

1. Type/ Model


2. Type Certificate Holder

Hartzell Propeller Inc.
One Propeller Place
Piqua, OH 45356-2634
USA

3. Manufacturer

Hartzell Propeller Inc.

4. Date of Application

<table>
<thead>
<tr>
<th>Model</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC-E5A-2</td>
<td>Before 2004*</td>
</tr>
<tr>
<td>HC-E5A-3</td>
<td>08 April 2015</td>
</tr>
<tr>
<td>HC-E5A-31</td>
<td>15 April 2019</td>
</tr>
<tr>
<td>HC-E5B-5</td>
<td>Before 1991**</td>
</tr>
<tr>
<td>HC-E5N-3</td>
<td>Before 1991**</td>
</tr>
<tr>
<td>HC-E5N-5</td>
<td>13 April 2022</td>
</tr>
<tr>
<td>HC-E5P-3</td>
<td>15 November 2017</td>
</tr>
</tbody>
</table>

*: The exact Date of Application was not recorded in Switzerland joining EASA 1 December 2006.
**: The exact Date of Application was not recorded in individual EASA Member States.

5. EASA Certification Reference Date

<table>
<thead>
<tr>
<th>Date</th>
<th>Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 August 1990:</td>
<td>HC-E5B-5 and HC-E5A-2</td>
</tr>
<tr>
<td>19 March 2013:</td>
<td>HC-E5N-3</td>
</tr>
<tr>
<td>26 July 2013:</td>
<td>HC-E5A-3</td>
</tr>
<tr>
<td>30 August 2017:</td>
<td>HC-E5P-3, HC-E5A-31 and HC-E5N-5</td>
</tr>
</tbody>
</table>

6. EASA Type Certification Date

<table>
<thead>
<tr>
<th>Model</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC-E5A-2</td>
<td>23 December 2004*</td>
</tr>
<tr>
<td>HC-E5A-3</td>
<td>05 November 2015</td>
</tr>
<tr>
<td>HC-E5A-31</td>
<td>22 May 2019</td>
</tr>
<tr>
<td>HC-E5B-5</td>
<td>06 September 1991**</td>
</tr>
<tr>
<td>HC-E5N-3</td>
<td>06 September 1991**</td>
</tr>
<tr>
<td>HC-E5N-5</td>
<td>03 May 2022</td>
</tr>
<tr>
<td>HC-E5P-3</td>
<td>08 May 2018</td>
</tr>
</tbody>
</table>

*: The EASA Certification Date has been taken over from Switzerland joining EASA 1 December 2006.
**: The EASA Certification Date has been taken over from individual EASA Member States.
II. Certification Basis

1. State of Design Authority Certification Basis

Refer to FAA TCDS no. P20NE.

2. EASA Certification Basis

2.1. Airworthiness Standards

**HC-E5B-5***:

**HC-E5A-2***:
14 CFR Part 35 with amendments 35-1 through 35-6 effective 18 August 1990 and Special Condition no. 35-002-SC.

**HC-E5N-3***:

**HC-E5A-3, HC-E5P-3, HC-E5A-31 and HC-E5N-5**:
CS-P Amendment 1 effective 16 November 2006.

*: Application was made to EASA Member States before EASA was established. Refer to Commission Regulation (EU) No 748/2012.

These propeller models are EASA certified based on member states approvals prior to EASA existence. The original and updated FAA certification basis as indicated above had been taken over from the FAA TCDS.

2.2. Special Conditions

None

2.3. Equivalent Safety Findings

None

2.4. Deviations

None
III. Technical Characteristics

1. Type Design Definition

The propeller type is defined by a propeller assembly drawing including a parts list (or later approved revisions).

HC-E5A-31: Drawing 106869, rev -, dated 14 January 2019
HC-E5B-5: Drawing E-2860, rev D, dated 10 March 1994
HC-E5N-3: Drawing D-3736, rev D, dated 23 October 1989
HC-E5N-5: Drawing 106521, dated 21 March 2018
HC-E5P-3: Drawing 105914, rev A, dated 28 September 2017

2. Description

The propeller is a 5-blade variable pitch propeller with a hydraulically operated blade pitch change mechanism providing the operation mode “Constant Speed”. The -2, -3 and -5 models incorporate feathering and unfeathering features. The -3 and -5 models are approved for installation as reversing propellers with appropriate reversing controls.

The -2 models do not reverse. (See Note 4).

The HC-E5A-31 model is identical except the beta feedback mechanism is electronic rather than hydro-mechanical.

The hub is a two piece aluminium hub. Each blade is supported in the hub with a ball thrust bearing. Optional equipment includes spinner and deicing (See Note 7).

3. Equipment

Spinner: See Note 7.
Governor: See Note 3.
Ice Protection: See Note 7.

4. Dimensions

See table of Section IV.

5. Weight

Depending on Propeller-Design Configuration:
See table of Section IV.

6. Hub/Blade Combinations

See table of Section IV.

7. Control System

Propeller governors: See Note 3.
8. Adaptation to Engine

Special flange: See Note 1.

9. Direction of Rotation

Direction of rotation (viewed in flight direction) as identified by a letter-code in the propeller designation (See Note 5).
### IV. Operating Limitations

<table>
<thead>
<tr>
<th>Blades (See Note 2)</th>
<th>Max. Continuous kW - rpm (min⁻¹)</th>
<th>Take Off kW - rpm (min⁻¹)</th>
<th>Diameter Limits (cm) (See Note 2)</th>
<th>Approx. Max. Wt. Complete (kg) (See Notes 3,7)</th>
<th>Blade Construction (See Note 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC-E5N-3 E8218-0 to E8218-10</td>
<td>633,8 2200</td>
<td>633,8 2200</td>
<td>215,9 to 190,5 (-0 to -10)</td>
<td>81,2</td>
<td>Aluminum Alloy</td>
</tr>
<tr>
<td>HC-E5N-3 E8492-0 to E8492-10</td>
<td>708,4 2000</td>
<td>708,4 2000</td>
<td>219,7 to 194,3 (-0 to -10)</td>
<td>83,5</td>
<td>Aluminum Alloy</td>
</tr>
<tr>
<td>HC-E5A-2 NC8834-0 to NC8834-10</td>
<td>708,4 2000</td>
<td>708,4 2000</td>
<td>231,1 to 205,7 (-0 to -10)</td>
<td>68,9</td>
<td>Carbon Composite</td>
</tr>
<tr>
<td>HC-E5B-5 E12902</td>
<td>1226,7 1390</td>
<td>1226,7 1390</td>
<td>335,3</td>
<td>76,2</td>
<td>Aramid Composite</td>
</tr>
<tr>
<td>HC-E5A-2 E9193</td>
<td>1230,4 2000</td>
<td>1230,4 2000</td>
<td>238,7</td>
<td>79,4</td>
<td>Carbon Composite</td>
</tr>
<tr>
<td>HC-E5A-3 and HC-E5A-31 NC10245-0 to NC10245-10</td>
<td>894,8 1700</td>
<td>894,8 1700</td>
<td>266,7 to 241,3 (-0 to -10)</td>
<td>69,4</td>
<td>Carbon Composite</td>
</tr>
<tr>
<td>HC-E5P-3 NC10245-0 to NC10245-10</td>
<td>894,8 1700</td>
<td>894,8 1700</td>
<td>266,7 to 241,3 (-0 to -10)</td>
<td>69,4</td>
<td>Carbon Composite</td>
</tr>
<tr>
<td>NC10245-0 to NC10245-10</td>
<td>894,8 1700</td>
<td>894,8 1700</td>
<td>269,2 to 243,8 (-0 to -10)</td>
<td>69,9</td>
<td>Carbon Composite</td>
</tr>
<tr>
<td>HC-E5N-5 NC10905-0 to NC10905-10</td>
<td>820,3 1591</td>
<td>820,3 1591</td>
<td>284,5 to 259,1 (-0 to -10)</td>
<td>76,2</td>
<td>Carbon Composite</td>
</tr>
</tbody>
</table>

1. **Approved Installations**

The HC-E5 series propellers are intended to be installed at King Air aircraft models. The HC-E5A-31 is controlled by an integrated electronic system which is part of the engine type design. It is used only with the Pratt & Whitney PT6E-67XP series engine.

2. **Maximum Take Off Power and Speed**

   See Table of Section IV.

3. **Maximum Continuous Power and Speed**

   See Table of Section IV.

4. **Propeller Pitch Angle**

   See Note 3.
**V. Operating and Service Instructions**

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration Manual</td>
<td>Hartzell Manual 190*</td>
</tr>
<tr>
<td>Propeller Owner’s Manual and Logbook (incl. Airworthiness Limitations)</td>
<td>Hartzell Manuals 147* and 149*</td>
</tr>
<tr>
<td>Aluminium Blade Overhaul Manual</td>
<td>Hartzell Manual 133C*</td>
</tr>
<tr>
<td>Composite Blade Overhaul Manual</td>
<td>Hartzell Manual 135F*</td>
</tr>
<tr>
<td>Metal Spinner Maintenance Manual</td>
<td>Hartzell Manual 127*</td>
</tr>
<tr>
<td>Service Bulletins</td>
<td></td>
</tr>
</tbody>
</table>

*: or later approved revision
VI. Notes

1. Hub Model Designation: (See Notes 4 and 5)

   - Character when used denotes a minor change not affecting interchangeability or eligibility
   - L when used denotes left-hand rotation
   - Denotes specific design features
     - 2: no beta feedback mechanism
     - 3: external beta feedback mechanism
     - 31: external beta feedback mechanism with electrical interface
     - 5: internal beta feedback mechanism
   - N denotes flange with eight 9/16” bolts and two ½” dowels on a 4.25” bolt circle
   - A denotes flange with twelve 9/16” bolts and two 5/8” dowels on a 5.125” bolt circle
   - B is identical to A except for dowel position
   - Number of blades
   - Identifies basic design
   - Hartzell Controllable

2. Blade Model Designation: (See Notes 5 and 6)

   - Number of inches cut off from (or added to if +) basic diameter
   - B or K denotes deicing boots
   - S when used with aluminum blades denotes a shot-peened exterior
   - Any other character denotes a minor modification not affecting eligibility
   - Basic model or template
   - Basic diameter in inches. Add three inch correction for all blade models.
   - Blade shank configuration:
     - E denotes right-hand tractor
     - NC denotes right-hand tractor composite blade with counterweight
     - HE or HNC denotes right-hand pusher
     - LE or LNC denotes left-hand pusher
     - JE or JNC denotes left-hand tractor
3. **Pitch Control:** (Weight of pitch control extra) (See Notes 4 and 10)
   
   (a) Maximum output pressure: 4826.33 kPa.
   
   (b) All propeller models have counterweighted blades and use governor oil to decrease pitch.
   
   (c) The Hartzell propeller model HC-E5A-2 with E9193 blades is controlled by an integrated control system which is part of the engine type design. The propeller model HC-E5A-2 with E9193 blades complies with the propeller airworthiness requirements when used with the Pratt & Whitney PT6A-68B engine only. Any change to the engine, including its control system, which affects or may affect the propeller approval must be substantiated to demonstrate that the propeller as integrated with the changed engine, including its control system, still complies with the propeller certification basis. Also, any change to the engine resulting from a change to the propeller must be substantiated to demonstrate that the changed engine still complies with the engine certification basis. Maximum output pressure for the HC-E5A-2 propeller model: 4826.33 kPa.
   
   (d) Hartzell propeller model HC-E5A-31( ) is controlled by an integrated electronic system which is part of the engine type design. Propeller model HC-E5A-31( ) complies with the propeller airworthiness requirements when used only with the Pratt & Whitney PT6E-67XP series engine, whose electronic software is written based on inputs from Hartzell’s dynamic simulation models. Any changes to the engine or propeller, including its control system, which affects or may affect the propeller or aircraft approval must be substantiated to demonstrate that the propeller as integrated with the engine, including its control system, still complies with the propeller and the engine certification basis.
   
   (e) All governors and propeller control systems must be approved as part of the aircraft installation regardless of manufacturer.

4. **Feathering:**
   
   (a) The -2, -3 and -5 models incorporate feathering and unfeathering features.

Reversing:
   
   (a) The -3 and -5 models are approved for installation as reversing propellers with reversing controls.
   
   (b) The -2 models do not reverse.

5. **Left-Hand Models:** (See Notes 1 and 2)
   
   The left-hand version of an approved propeller model is approved at the same rating and diameter as listed for the right-hand model.

6. **Interchangeability:** (See Note 2)
   
   (a) Shot-peened blades may replace non shot-peened blades either individually or as a set.
   
   (b) Refer to Hartzell Service Letter HC-SL-30-260 for ice protection system component interchangeability.

7. **Accessories:**
   
   (a) Propeller spinner. (Weight of spinner extra)
   
   (1) Approved with Hartzell and other manufacturers’ spinners when listed on Hartzell type design data.
   
   (2) All propeller spinners must be approved as part of the aircraft installation regardless of manufacturer. (See Note 10)
(b) Propeller deicing (Weight of deicing equipment extra)

   (1) Approved with Goodrich electrical deicing kit SEXXXX-X, 7EXXXX-X, 6S-XXX, 67-XXX, or 77-XXX when the specific kit number is listed on Hartzell type design data and installed in accordance with Goodrich Report no. ATA 30-60-07.

   (2) Approved with Safeway deice equipment when installed in accordance with Safeway Installation Manual, Hartzell Manual 133( ) for aluminum blades or Manual 135( ) for composite blades, and associated STC or PMA documentation.

   (3) Propeller models listed in this data sheet are approved for use with propeller ice protection equipment listed in Hartzell Manual 159( ) or in other Hartzell type design data.

   (4) All propeller ice protection equipment must be approved as part of the aircraft installation regardless of manufacturer. (See NOTE 10)

(c) Propeller pulley drive. (Weight of pulley drive extra)

   (1) Propeller model HC-E5A-2 with blade model E9193 is approved with Pilatus Aircraft Ltd. air conditioning system pulley drive P/N 521.55.21.002.

8. Shank Fairings: Not applicable.

9. Special Limits: Not applicable.

10. The propeller installation must be approved as part of the aircraft Type Certificate to demonstrate compliance with the applicable aircraft airworthiness standards.

    Propeller models listed herein consist of basic hub and blade models. Most propeller models include additional characters to denote minor changes and specific features as explained in Notes 1 and 2.

10a. This propeller has been certificated in accordance with CS-P subparts A, B and C. Compliance with the requirements of Subpart D, which is specific to each aircraft installation, has not yet been demonstrated.

11. Special Limits:

    (a) Life Limits and Mandatory Inspections

        (1) Airworthiness limitations, if any, are specified in Hartzell Manuals 147 and 149.

        (2) The appropriate propeller organisation must evaluate the propeller installation for each new aircraft installation to assess possible changes in the airworthiness limitation

12. Special Notes:

    (a) Refer to Hartzell Manual no. 202( ) for overspeed and overtorque limits.

    (b) Refer to Hartzell Service Letter HC-SL-61-61( ) for recommended overhaul periods.

13. The EASA approved Airworthiness Limitations Section of the Instructions for Continued Airworthiness is published in the applicable Propeller Owner’s Manual, chapter 5 "Airworthiness Limitations”.

14. EASA Type Certificate and Type Certificate Data Sheet No. IM.P.125 replace the associated Type Certificates and Type Certificate Data Sheets of the EASA Member States.
SECTION: ADMINISTRATIVE

I. Acronyms and Abbreviations
N/A

II. Type Certificate Holder Record
N/A

III. Change Record

<table>
<thead>
<tr>
<th>Issue</th>
<th>Date</th>
<th>Changes</th>
<th>TC issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue 01</td>
<td>24 September 2013</td>
<td>Initial Issue. Add hub HC-E5A-2, HC-E5B-5 and HC-E5N-3 models</td>
<td>24 September 2013</td>
</tr>
<tr>
<td>Issue 02</td>
<td>03 July 2014</td>
<td>Add blade E8492 model</td>
<td>N/A</td>
</tr>
<tr>
<td>Issue 03</td>
<td>05 November 2015</td>
<td>Add hub HC-E5A-3 and blade NC10245 model</td>
<td>05 November 2015</td>
</tr>
<tr>
<td>Issue 04</td>
<td>08 May 2018</td>
<td>Add hub HC-E5P-3 and blade NC10320 model</td>
<td>08 May 2018</td>
</tr>
<tr>
<td>Issue 05</td>
<td>22 May 2019</td>
<td>Add hub HC-E5A-31</td>
<td>22 May 2019</td>
</tr>
<tr>
<td>Issue 06</td>
<td>03 May 2022</td>
<td>Add hub HC-E5N-5 and blade NC10905 model (EASA major change approval 10079150)</td>
<td>03 May 2022</td>
</tr>
</tbody>
</table>

-END-