SPECIFIC AIRWORTHINESS SPECIFICATION

NO. EASA.SAS.AS.512

for
LINDSTRAND HS-110 HOT AIR AIRSHIP

For models: Lindstrand HS-110

This Specific Airworthiness Specification is issued in accordance with Commission Regulation (EU) 748/2012, paragraph 21.A.173 (b)2 for the purposes of the issue of a Restricted Certificate of Airworthiness.

This Specific Airworthiness Specification cancels and replaces TC No EASA.BA.512 and TCDS No. EASA.BA.512.
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SECTION 1 AIRCRAFT DESIGN DEFINITION
SECTION A MODEL DESIGNATION

A.I General

1. Data Sheet No: EASA.BA.512 Issue Date: 23 December 2009
2. Type / Variant or Model Lindstrand HS-110
3. Airworthiness Category: Standard
4. Type Certificate Holder: LINDSTRAND HOT AIR BALLOONS LTD
   Maesbury Road
   Oswestry
   Shropshire
   SY10 8ZZ
   United Kingdom
5. Manufacturer: LINDSTRAND HOT AIR BALLOONS LTD
   Maesbury Road
   Oswestry
   Shropshire
   SY10 8ZZ
   United Kingdom
6. National approval date: 16 April 1997
7. CAA Application date: 24 August 1995
8. CAA Recommendation date: -
9. EASA Certification date: 8 October 2007
10. TCDS History: This EASA TCDS replaces the British TCDS (see II. Certification Basis) issued by the UK CAA

A.II Certification Basis

1. Reference Date for determining the applicable requirements: 24 August 1995
2. UKCAA Type Certificate Data Sheet No.: BAS 6
3. UKCAA Type Certification Basis: BCAR Draft Paper 696 (second draft) Issue 1, dated 27 January 1978 and the relevant parts of BCAR 31 at Issue 1 and Appendix 1 to CAA letter ref: 9/30/1PA. In addition, as the envelope is pressurised other than by ram or slipstream air, BCAR Section Q 3-3 3.1(a) gust case has been applied and the tear resistance properties of the envelope was required to be substantiated by full tear tests.
CAA Airworthiness Notice No. 33 Unprotected Starter Circuits

CAA Airworthiness Notice No. 88 Bus Bar Low Voltage Warning

4. Airworthiness Requirements: Aircraft variants which are certified in accordance with the certification basis given in II. are indicated in III.

5. Special Conditions: The operation of the airship at night / VMC is possible with Modification L33 embodied.

6. Reversion and Exemptions: None

7. Equivalent Safety Findings: None

8. Environmental Standards: None

A.III Technical Characteristics and Operational Limitations

   Gondola Drawing No.: HG-001-A-001

2. Description: Manned hot air airship, configuration ‘110’ and ‘120’ correspond to standard and enhanced lift capability
   2.1 Envelope
   A rotationally symmetric streamlined envelope with rear cruciform empennage which are pressurised by propeller slipstream and a motorised pressurisation fan. Two rip panels are fitted for final deflation and two fabric overpressure valves are fitted to control envelope pressure levels. Rudders are activated by pulling on cords in the gondola. Gondola loads are primarily transferred into the envelope through two catenaries which attach to the upper inside of the envelope. Nose and tail lines are fitted for ground control.
   2.2 Gondola
   A two-seat gondola made from tubular stainless steel framework, partially covered with glass reinforced plastic. There is a fixed landing gear with four pneumatic tyres, a pusher engine / propeller powerplant and a double burner envelope heating system.
3. Equipment: 1 off Combined Flytec 3040 flight instrument incorporating:
   a. Altimeter
   b. Variometer
   c. Envelope Temperature
   1 off Rotax Flydat combined engine management system
   2 off Pressure gauges for burner fuel
   2 off Quantity gauge for burner fuel
   1 off Quantity of engine fuel
   1 off Envelope pressure gauge

Remark: The airspeed indicator may be omitted as $V_{\text{max}}$ is lower than $V_{\text{NE}}$.

4. Dimensions: Approximate Dimensions:

   For HE-110-A-001
   Volume: 3 125 m³ 110 358 cu.ft.
   Length: 36.5 m 118.1 ft
   Diameter: 13.02 m 42.7 ft
   Stabiliser Span: 14.8 m 48.5 ft

   For HE-110-A-002 configuration ‘120’
   Volume: 3 415 m³ 120 529 cu.ft.
   Length: 38.6 m 126.6 ft

5. Power Plant: Engine and propeller are certified in conjunction with the Airship Type Certificate.

   5.1 Engine
   Type Designation: Rotax 582 UL
   Maximum Permissible rpm: 6 500
   Maximum Continuous rpm: 6 200

   5.2 Propeller
   Type Designation: Arplast DAS 152
   Propeller Data: 154 cm diameter four blade fixed pitch

   5.3 Burner
   Burner Designation: Jetstream Double Airship Burner
   Burner Drawing: HS-001-A-700
   Technical Description: Double Burner with electric ignition system and hydraulic main valve actuation. Burner mounted to pivot sideways allowing gimbal movement for inflation.

6. Fluids: 6.1 Fuels
   Propulsion and Pressurisation
Engines: 90 RON petrol (unleaded)
Tank Capacity: 22 L
See Flight Manual.

6.2 Lubricants
Propulsion Engine: Castrol TTS
Maximum Capacity: 1.1 L
Gearbox: SAE 85W-140EP or equivalent
Gearbox Contents: 0.41 L
Pressurisation Engine: SAE 10W40
Maximum Capacity: 0.65 L

6.3 Coolant
Propulsion Engine: 75% water and 25% antifreeze mixture
Maximum Contents: 2.31 L
Antifreeze Type: Suitable for aluminium block engine (e.g. Silkolene Pro Cool)

7. Air Speed: Maximum measured speed 15.0 knots (27.8 km/hr)
8. Maximum Mass:
   For HS-110-A-001 Maximum take-off mass (MTOM) = 900 kg
   For HS-110-A-002 Maximum take-off mass (MTOM) = 999 kg
9. Minimum Flight Crew: 1 Pilot
10. Occupants:
    Maximum two, one in each seat
11. Payload:
    See Flight Manual for payload calculation
12. Life Limit Parts:
    All fuel hoses: 10 years
    See Flight and Maintenance Schedule
13. Lifting Gas:
    Hot air
    Maximum continuous envelope temperature: 125ºC
    Never exceed envelope temperature: 127ºC
    Maximum envelope pressure: 20 mm WG
    Minimum envelope pressure: 3 mm WG
14. Centres of Buoyancy:
    For HE-110-A-001 Reference plane perpendicular to the longitudinal axis 16.64 m from the nose.
For ‘configuration ‘120’ HE-110-A-002 the distance is 18.24 m from the nose.

15. Maximum Altitude: Dependent on ambient conditions and payload. See Flight Manual for calculation

A.IV Operating and Service Instructions

1. Operating Instructions: Up to s/n 1268 incl.:
   Flight Manual ref. LBL HAA FM, Issue 1.1,
   CAA approval 18 April 1997

   From s/n 1269 and up:
   Flight Manual ref. LBL HAA FM, Issue 1.3,
   EASA approval 23 December 2009.

2. Service Instruction: Maintenance Schedule ref. LBL HAAMS, Issue 1.2,
   accepted 4 January 1999

A.V Notes

Note Certified for day VMC flight and night VMC flight with Modification L33 embodied.

* * *
**AIRWORTHINESS DIRECTIVES and mandatory Service Bulletins**

ROTAX Aircraft Engines Service Bulletins:
ASB-912-069ULR1
ASB-914-051ULR1
ASB-2ST-003R1

**SECTION 2  OCCURRENCE REPORTING**

The Specific Airworthiness Specification may be used as a basis for the issue of a Restricted Certificate of Airworthiness in accordance with 21.A.173 (b)2 under the following conditions:

a) The holder of a Restricted Certificate of Airworthiness based on this Specific Airworthiness Specification shall report to the Agency any identified condition of the aircraft, which endangers flight safety.

b) Reports shall be made as soon as practicable, but in any case within 72 hours by using the reporting tool at [http://www.aviationreporting.eu/](http://www.aviationreporting.eu/)
   Please select “EASA” when being asked to select the State to report to.

**SECTION 3  OTHER LIMITATIONS**

This EASA.SAS.BA.512 is applicable to the following serial numbers as listed in the table below:

<table>
<thead>
<tr>
<th>Type/Model</th>
<th>Serial number</th>
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<tbody>
<tr>
<td>HS-110</td>
<td>174</td>
</tr>
<tr>
<td>HS-110</td>
<td>253</td>
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<td>HS-110</td>
<td>362</td>
</tr>
<tr>
<td>HS-110</td>
<td>546</td>
</tr>
</tbody>
</table>

Any aircraft registered in a member state before EASA rules apply in that state are eligible to be “grandfathered” and covered by this SAS. Contact generalaviation@easa.europa.eu for updating the list of serial numbers.

**SECTION 4  TRANSITION PERIOD**

This Specific Airworthiness Specification is issued in accordance with Commission Regulation (EU) 748/2012 Part 21, paragraph 21.A.173 (b)2 for the purposes of the issue of a Restricted Certificate of Airworthiness.

This Specific Airworthiness Specification cancels and replaces TC No EASA.BA.512 and TCDS No. EASA.BA.512

The individual aircraft must be transferred from its Certificate of Airworthiness linked to the TCDS no. EASA.BA.512 to a Restricted Certificate of Airworthiness linked to this SAS EASA.SAS.AS.512 before 31.01.2020.
SECTION 5 ADMINISTRATIVE

I. Acronyms & Abbreviations

II. Change Record

<table>
<thead>
<tr>
<th>Issue</th>
<th>Date</th>
<th>Changes</th>
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<tr>
<td>Issue 01</td>
<td>14 Jan 2019</td>
<td>Initial Issue</td>
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