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

1. Type Design Definition: Drawing No.: HS-110-A-001 and HS-110-A-002

Envelope Drawing No.: HE-110-A-001 and HE-110-A-002

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

2. Description: Manned hot air airship, configuration '110' and '120' correspond to standard and enhanced lift capability

2.1Envelope

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.

2.2Gondola

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: incorporating:

1 off Combined Flytec 3040 flight instrument

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_{max} is lower than V_{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.

5.1Engine

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

5.2Propeller

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

5.3Burner

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:

6.1Fuels

Propulsion and Pressurisation

Engines:	90 RON petrol (unleaded)
Tank Capacity:	22 L
Heater System:	Propane. Maximum capacity 160 L (80 kg). See Flight Manual.

6.2Lubricants

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

6.3Coolant

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: kg
For HS-110-A-001 Maximum take-off mass (MTOM) = 900

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.

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AIRWOTHINESS 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/
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:

Type/Model	Serial number
HS-110	174
HS-110	253
HS-110	362
HS-110	546

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 to 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

Issue	Date	Changes
Issue 01	14 Jan 2019	Initial Issue

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