

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

G17CE
Revision 1
Schempp-Hirth Flugzeugbau GmbH
Discus-2a
Discus-2b
Discus-2c
October 20, 2009

TYPE CERTIFICATE DATA SHEET NO. G17CE

This data sheet, which is part of Type Certificate No. G17CE prescribes conditions and limitations under which the product for which the Type Certificate was issued meets the airworthiness requirements of the Federal Aviation Regulations.

Type Certificate Holder: Schempp-Hirth Flugzeugbau GmbH
Krebenstrasse 25
D-73230 Kirchheim/Teck
Germany

I. Model "Discus-2a", Glider (Utility) Category, approved April 3, 2003

<u>Airspeed Limits (IAS)</u>		kts	mph	km/h
	V_{NE} (never exceed)			
	0- 3000 m (9843 ft)	135	155	250
	4000 m (13123 ft)	130	149	240
	5000 m (16404 ft)	123	141	227
	6000 m (19685 ft)	116	134	215
	7000 m (22966 ft)	110	126	203
	8000 m (26247 ft)	104	119	192
	9000 m (29528 ft)	98	112	181
	10000 m (32808 ft)	92	106	170
	V_{RA} (in rough air)	108	124	200
	V_A (maneuvering)	108	124	200
	$V_{Airbrakes}$	135	155	250
	V_T (Aerotow)	97	112	180
	V_w (Winch Launch)	81	93	150
	V_{LO} (U/C Operation)	97	112	180

C.G. Range Max. Forward C.G.: 9.72 in. (247 mm) aft of datum
Max. Aft C.G.: 15.00 in. (381mm) aft of datum

Empty Weight C.G. See Maintenance Manual. (Record of Weight and Balance)

Datum Wing leading edge at wing root rib

Leveling Means Upper edge of a wedge 100:3.125 to be horizontal when placed on rear top of fuselage.

Maximum Weight 1157 lbs (525 KG)

No. of Seats One

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Maximum Baggage An enclosed baggage compartment is not provided.

Water Capacity Both wing tanks: 52.84 U.S. Gallons (200 Liters)
Fin: 2.06 U.S. Gallons (7.80 Liters)

Control Surface Movements

Aileron
Up 2.48 ± .12 in. (63 ± 3 mm)
Down 1.18 ± .12 in. (30 ± 3 mm)
Measured 5.98 in. (152 mm) from hinge axis

Elevator:
Up 1.73 ± 0.12 in. (44 + 3 mm)
Down 1.73 ± 0.08 in. (44 - 2 mm)
Measured 5.43 in. (138 mm) from hinge axis

Rudder:
to either side 6.10 ± 0.59 in. (155 ± 15 mm)
Measured 12.72 in. (323 mm) from hinge axis.

Weak link for towing 1157 to 1506 lbs. (525 to 683 daN)

II. Model "Discus-2b", Glider (Utility) Category, approved April 3, 2003

	fts	mph	km/h
<u>Airspeed Limits (IAS)</u>			
V _{NE} (never exceed)			
0- 3000 m (9843 ft)	135	155	250
4000 m (13123 ft)	130	149	240
5000 m (16404 ft)	123	141	227
6000 m (19685 ft)	116	134	215
7000 m (22966 ft)	110	126	203
8000 m (26247 ft)	104	119	192
9000 m (29528 ft)	98	112	181
10000 m (32808 ft)	92	106	170
V _{RA} (in rough air)	108	124	200
V _A (maneuvering)	108	124	200
V _{Airbrakes}	135	155	250
V _T (Aerotow)	97	112	180
V _w (Winch Launch)	81	93	150
V _{LO} (U/C Operation)	97	112	180

C.G. Range Forward C.G.: 9.84 in. (250 mm) aft of datum
Aft C.G.: 15.59 in (396mm) aft of datum

Empty Weight C.G. See Maintenance Manual

Datum Wing leading edge at wing root rib

Leveling Means Upper edge of a wedge 100:4.4 to be horizontal when placed on rear top of fuselage.

Maximum Weight 1157 lbs (525 Kg)

No. of Seats One

Maximum Baggage An enclosed baggage compartment is not provided.

Water Capacity Both wing tanks: 52.84 U.S. Gallons (200 Liters)
Fin: 2.06 U.S. Gallons (7.80 Liters)

Control Surface Movements

Aileron
 Up 2.48 ± .12 in. (63 ± 3 mm)
 Down 1.18 ± .12 in. (30 ± 3 mm)
 Measured 5.98 in. (152 mm) from hinge axis

Elevator:
 Up 1.73 ± 0.12 in. (44 + 3 mm)
 Down 1.73 ± 0.08 in. (44 - 2 mm)
 Measured 5.43 in. (138 mm) from hinge axis

Rudder:
 to either side 6.10 ± 0.59 in. (155 ± 15 mm)
 Measured 12.72 in. (323 mm) from hinge axis.

Weak link for towing

1157 to 1506 lbs. (525 to 683 daN)

III. Model "Discus-2c", Glider (Utility) Category, approved October 20, 2009Airspeed Limits (IAS).

Warning: At higher altitudes, the true airspeed is higher than the indicated airspeed, so V_{NE} is reduced according to the table below:

V_{NE} (never exceed)	kts	mph	km/h
0 -2000 meters (0 - 6562 ft)	151	174	280
3000 meters (9843 ft)	144	166	267
4000 meters (13123 ft)	137	157	253
5000 meters (16404 ft)	130	149	240
6000 meters (19685 ft)	122	141	227
7000 meters (22966 ft)	116	134	215
8000 meters (26247 ft)	110	126	203
9000 meters (29,528 ft)	103	119	191
10,000 meters (32,808 ft)	97	112	180

Airspeed Limits, cont'd

		kts	mph	km/h
V_A	Maneuvering speed	103	118	190
V_{RA}	Rough air speed	103	118	190
V_T	Max. aerotow speed	97	112	180
V_W	Max winch speed	81	93	150
V_{LO}	Max. landing gear operating speed	97	112	180

Airspeed Indicator Markings:

	IAS Range	Significance
Green Arc	51 – 103 kts 59 – 118 mph 95 – 190 km/h	<u>Normal operating range:</u> (Lower limit is the speed $1.1V_{S1}$ at maximum weight and c/g in most forward position; Upper limit is the maximum permissible speed in rough air.
Yellow Arc	103 – 151 kts 118 – 174 mph 190 – 280 km/h	Maneuvers must be conducted with caution and operating in rough air is not permitted.
Red Line	151 kts 174 mph 280 km/h	Maximum speed for all operations
Yellow Triangle	57 kts 65 mph 105 km/h	Approach speed at maximum weight without water ballast

C.G. Range

Max. forward position: 11.02 in. (280 mm) aft of datum
Max. rearward position: 16.54 in. (420 mm) aft of datum

Empty Weight C.G.

See Maintenance Manual.

Datum

Wing leading edge at root rib

Leveling Means

Position: Upper edge of a wedge 100:4.4 to be horizontal when placed on rear top of fuselage.

Maximum Weight

	Wing Span	
	15 m	18 m
Max. take-off and landing incl. water ballast	1157 lb (525 kg)	1246 lb (565 kg)
Max. take-off and landing w/o water ballast	946 lb (430 kg)	968 lb (440 kg)
Max. weight of all non-lifting parts (m_{NT})	616 lb (280 kg)	616 lb (280 kg)
Max weight in baggage compartment (see FM)	4.4 lb (2 kg)	4.4 lb (2 kg)

Max. water ballast:

	Wing Span	
	15 m	18 m
In the wings:	440 lbs (200 kg)	440 lbs (200 kg)
C.G. position (aft of datum):	8.15 in (207 mm)	8.15 in (207 mm)
In the fin (optional):	17.6 lbs (8 kg)	17.6 lb (440 kg)
C.G. position (aft of datum):	169.49 in (4305 mm)	169.49 in (4305 mm)

No. of Seats: One
Moment arm: 19.69 in (500mm) forward of datum

Control Surface Movements

Aileron

Up: 2.48 ± 0.12 in. (63 mm ± 3 mm)
Down: 1.18 ± 0.12 in. (30 mm ± 3 mm)
Measured 5.98 in. (152 mm) from hinge axis

Elevator:

Up or Down: 1.73 + 0.12 in. (44 mm + 3 mm)
- 0.08 in (- 2 mm)
Measured 5.55 in. (141 mm) from hinge axis

Rudder:

to either side 6.30 ± 0.79 in. (160 ± 20 mm)
Measured 12.99 in. (330 mm) from hinge axis.

Weak Link for Towing: Max 1620 lbs (735 daN)

Information Applicable to All Models

Serial Nos. Eligible See Import Requirement

Certification Basis For the Discus-2a, -2b, and -2c:

The regulations (unless otherwise stated) are Title 14 of the Code of Federal Regulations (14CFR):

- 1) 14CFR21.23, 21.29 and 21.50 effective February 1, 1965 including Amendment 21-1 through 21-68.
- 2) JAR22 Joint Airworthiness Requirements for Sailplanes and Powered Sailplanes (Change 4 of the English Original Issue), dated June 27, 1989, as Amended by Orange Papers (OP) OP22/90/1 (except 22.611(a)).
- 3) JAR 22.785(e)(f), Seat and Restraint System, Change 6, dated 26 September, 2000.
- 4) JAR 22.788, Head Rests, Change 6, dated 26 September, 2000.
- 5) FAA Equivalent Level of Safety number ACE-09-09 to JAR 22.207, Change 4, "Stall Warning" applies only to the Discus-2c.
- 6) LBA Standards for Structural Substantiation of Sailplanes and Powered Sailplane Parts Consisting of Glass or Carbon Fibre Reinforced Plastics, Dated July 1991.
- 7) Additional requirements for the installation of a water ballast system into the fin (for compensating the nose-heavy moment of water ballast in wing tanks). LBA Reference: I4 – I 413/89 dated October 25, 1989.
- 8) Exemption No. 4988 to 14CFR45, effective April 20, 1964, Amendments 45-1 through 45-16, Section 45.11(a) and (d) (External Identification Plate), pursuant to 14 CFR 11, effective November 10, 1962, Amendments 11-1 through 11-36, Sections 11.25 and 11.27.
- 9) FAA Type Certificate No. G17CE issued April 3, 2003.
- 10) Date of Application for FAA Type Certificate: September 24, 2002 (Discus-2a/-2b)
Date of Application for FAA Type Certificate: April 25, 2007 (Discus 2c)

- 11) Luftfahrt Bundesamt (LBA) German CAA issued Type Certificate 360 dated July 14, 1999. EASA Type Certificate No. EASA.A.049, Issue 1, dated September 16, 2005 replaces the above LBA type certificate and includes the Discus-2c

Import Requirements

A U.S. Standard Airworthiness Certificate may be issued on the basis of a Certificate of Airworthiness for Export signed by a representative of the LBA containing the following statement:

"The glider covered by this certificate has been examined, tested, and found to conform to the type design approved under FAA Type Certificate G17CE and to be in condition for safe operation."

For Discus-2a and Discus-2b sailplanes with serial numbers 13 up to 22, 24, 27, 28, 30 up to 48, 50, 51, 53 up to 55, 57 up to 63, 65, 67, 68, 71 up to 79, 81 and 82, these are eligible for a U.S. Standard Airworthiness Certificate, if Schempp-Hirth Flugzeugbau GmbH Technical Note No. 360-19, dated December 20, 2002, incorporated under LBA Airworthiness Directive 2003-048, has been complied with and if all import requirements of this TCDS are satisfied. All other Discus-2a and -2b sailplanes which comply with Schempp-Hirth Flugzeugbau GmbH Technical Note No. 360-16 are not affected by the requirements of Technical Note No. 360-19.

All serial numbered Discus-2c sailplanes are eligible for a U.S. Standard Airworthiness Certificate if all requirements of this TCDS are satisfied and applicable Airworthiness Directives have been implemented.

Modifications pre-dating the issuance of this Type Certificate which are not included in any of the above paragraphs of this TCDS, and modifications dated after the issuance of this Type Certificate not covered by note(s) contained in the Service Information paragraph of this TCDS must be assumed not approved under this Type Certificate.

The U.S. airworthiness certification basis for aircraft type certificated under 14CFR21 section 21.29 and exported by the country of manufacture is section 21.183(c).

The U.S. airworthiness certification basis for aircraft type certificated under 14CFR21 section 21.29 exported from countries other than the country of manufacture (e.g. third party country) is section 21.183(d).

Equipment

The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the glider for certification. In addition, the following items of equipment are required:

For the Discus-2a, -2b, and -2c:

1. Basic equipment and instruments:

Day VFR:

- a) airspeed indicator (knots)
- b) altimeter (feet and pressure scale in inches of Hg)
- c) outside air temperature indicator with sensor (when flying with water ballast.) This sensor must be installed in the ventilation air intake.
- d) four-piece safety harness (symmetrical)
- e) automatic or manual parachute or
- f) Back cushion (thickness approx. 3.94 in/10 cm when compressed)

Cloud flying (day):

- g) magnetic compass
- h) variometer
- i) turn and bank indicator with slip ball
- j) VHF-Transceiver

2. Discus-2a /-2b Flight Manual, LBA-approved dated October 1998 or later approved revision.
3. Discus-2c Flight Manual, LBA-approved and dated July 21, 2005 or later approved revision.

Service Information

"Service bulletins, structural repair manuals, vendor manuals, aircraft flight manuals, and overhaul and maintenance manuals, which contain a statement that the document is LBA approved, are accepted by the FAA and are considered FAA approved. These approvals pertain to the type design only."

Available Documents for the Schempp-Hirth Flugzeugbau GmbH model Discus-2a, Discus-2b and Discus-2c series:

1. Discus-2a and Discus-2b Flight Manuals approved October 1998 or later approved revision. Flight manual for the Discus-2c issued January 2005 and LBA approved July 21, 2005.
2. Instructions for Continued Airworthiness (Maintenance Manual) for Discus-2a and Discus-2b issued on October 1998 or later approved revision. Maintenance manual for the Discus-2c issued January 2005.
3. Repair instructions for the Discus-2a and Discus-2b issued October 1998 or later approved revision. Repair instructions for the Discus-2c located in the Maintenance Manual issued January 2005.
4. Operating instructions for the Tost nose tow release mechanism model E 85, latest approved version (if installed.)
5. Operating instructions for the Tost safety tow release mechanism model EUROPA G 88, latest approved version (if installed.)
6. "Airworthiness Limitations Section for Sailplanes Model Discus-2a and Discus-2b," February 2003 edition, LBA-approved March 13, 2003. "Airworthiness Limitation Section for the model Discus-2c", LBA-approved June 18, 2009.

NOTES

NOTE 1. Current weight and balance data including list of equipment included in the certificated empty weight and loading instructions, when necessary, must be provided for each glider at the time of original certification and at all times thereafter.

NOTE 2. The placards listed in the flight manual must be displayed. A complete listing of placards is in the Instructions for Continued Airworthiness Manual (Maintenance Manual).

The following placards must be displayed in clear view of the pilot:

1. "THE MARKINGS AND PLACARDS INSTALLED IN THIS GLIDER CONTAIN OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS GLIDER IN THE UTILITY CATEGORY. OTHER OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS GLIDER IN THIS CATEGORY ARE CONTAINED IN THE GLIDER FLIGHT AND MAINTENANCE MANUALS."
2. "Aerotow permitted from the forward hook only".
3. "Night flying is prohibited".
4. "Vne vs Altitude" placard must be located near the Airspeed indicator".

NOTE 3. Airworthiness Limitations are specified in the LIMITATION section of the Flight Manual, in the Instructions for Continued Airworthiness (Maintenance Manual), and in the "Airworthiness Limitations Section for Sailplanes Model Discus-2a and Discus-2b", February 2003 edition, LBA-approved March 13, 2003. For the Discus-2c, the Airworthiness Limitation Section was LBA-approved on June 18, 2009. These documents are

FAA-approved. These LIMITATIONS specify mandatory replacement times and operating limitations and may not be changed without FAA approval.

- NOTE 4. All external portions of the glider exposed to sunlight must be painted white except the surface for the areas provided for registration marking, wing tips, outboard end of ailerons, nose of fuselage, and rudder.
- NOTE 5. Major structural repairs must be accomplished at FAA certificated repair stations rated for composite aircraft structure work, in accordance with Schempp-Hirth Flugzeugbau GmbH repair methods approved by FAA.
- NOTE 6. Information essential for the proper operation, maintenance and inspection of the glider is contained in the Flight Manual, Maintenance Manual, and in the corresponding Airworthiness Limitations Section for sailplane models Discus –2a, Discus –2b, and the Discus-2c” manual.

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