

2.7 Mass (weight)

- A) Category Aerobatic
 Maximum Take-off mass: 625 kg, 1378 lbs.
 Maximum landing mass: 625 kg, 1378 lbs.
- B) Category Utility
 Maximum Take-Off mass: 750 kg, 1653 lbs.
 Maximum landing mass: 750 kg, 1653 lbs.
 Maximum mass of all non lifting parts = 445 kg (981 lbs.)

Maximum mass in baggage compartment = 15 kg(33 lbs.)

Caution: Heavy pieces of baggage must be secured to the baggage compartment floor (screwing to the floor or with belts). The max. mass secured on one half of the floor (left and right of fuselage centre line) should not exceed 7,5 kg (16.5 lbs.).

Warning: Follow the loading procedures see sect. 6.

2.8 Center of gravity

Center of gravity range in flight is

185 mm (7.28 in.) up to 480 mm (18.9 in.) behind datum.

datum = wing leading edge at the rootrib

reference line = aft fuselage centre line horizontal
 C.G. diagrams and loading chart see sect.6.

Warning: Flying is only allowed with the battery Z 07 installed in the fin as otherwise the forward C.G. limit may be exceeded. A suitable weight of 4.3 kg (9.5 lbs.) may be used instead of a battery.

2.9 Approved manoeuvres /

Airworthiness category "Utility":

This sailplane is certified for normal gliding and simple aerobatics. Aerobatics is approved only without water ballast in the wing tanks (and fin tank A). The following aerobatic manoeuvres are approved for all wingspan.

Manoeuvre	recommended entry speed IAS	
	km/h	kts.
Spins	/	/
Inside Loop	200	108
Stall Turn	200	108
Lazy Eight	200	108
Chandelle	200	108

6.8 Loading chart

6.8.1 Cockpit load see table on page 6.5.

a) single seated

max. load in the front seat 110 kg 242 lbs

min. load in the front seat see placard in cockpit and weighing report page 6.5

b) two seated

max. cockpit load is 210 kg (463 lbs) with a max. of 105 kg (231 lbs) in the front seat or 110 kg (242 lbs) in the front seat and 90 kg (198 lbs) in the rear seat.

min. cockpit load in the front seat is the min. cockpit load see a) minus 40% of the load in the rear seat.

With these loads, the C.G. range given under 2.8 will be kept in the limits if the empty weight C.G. is in its limits.

With lower pilot weight necessary ballast must be added in the seat. Ballast put on the seat (lead ballast cushion) must be fastened at the connection of the safety belts.

6.8.2 Removable Ballast (Option) see sect. 7.16.1.

6.8.3 Baggage: max. 15 kg (33 lbs)

Heavy pieces of baggage must be secured to the baggage compartment floor (screwing to the floor or with belts). The max. mass secured on one half of the floor (left and right of fuselage centre line) should not exceed 7,5 kg (16.5 lbs).

6.8.4 Battery in the fin:

Only the use of the factory supplied battery Z 07, (12 V, 10 Ah, Mass 4.3 kg, 9.5 lbs) is permitted.

Warning: Flying is only allowed with the battery in the fin as otherwise the forward C.G. limit may be exceeded.

Instead of the battery a suitable weight of 4.3 kg (9.51 lbs) may be used.

6.8.5 Waterballast in the wing tanks:

The tanks have a capacity of 80 l (21.2 US gal) per wing.

The allowed amount of waterballast

is dependent on the empty weight and of the load in the fuselage and can be determined from the diagram on page 6.7 "ballast chart".

It is only allowed to fly with symmetric wing ballast!

6.8.5 Fin ballast tanks (option)

a) Wing Ballast Compensation Tank (Tank A)

Water ballast in the fin tank should be used to compensate the forward move of C.G. due to the water ballast in the wings.

The amount of ballast in the fin is dependent on the amount of water in the wing tanks and to be determined from the following table.

in the wings		water ballast		in the fin tank	
kg	lbs	kg	lbs	kg	lbs
20	40	0.8	1.6		
40	80	1.6	3.3		
60	120	2.5	4.9		
80	160	3.3	6.5		
100	200	4.1	8.2		
120	240	4.9	9.8		
140	280	5.7	11.5		
160	320	6.6	13.1		
/	350	/	14.3		

b) Rear Pilot Mass Compensation Tank (Tank B)

The C.G. shift due to the rear pilot can be compensated by filling the ballast tank B). This is possible even without using wing ballast. The amount of ballast is to be determined from the following table.

Mass of rear pilot		water in the fin tank	
kg	lbs.	kg	lbs
60	120	7.4	14.7
70	140	8.6	17.2
80	160	9.8	19.7
90	180	11.0	22.1
100	200	12.2	24.03
/	220	/	26.9

Warning:

When flying solo tank B) must be emptied! Otherwise you will fly with a dangerous C.G. position.

The compensation of 100 kg pilot weight (rear seat) raises the min. cockpit load in the front seat by 40 kg!

The resulting value (min. cockpit load in front seat from weighing without ballast + 40 kg) must be entered in the table on page 6.5 as value XX and also on the placard at the indication lights for the fin tank on the front instrument panel.

When using the fin tanks make sure not to exceed the max. weight of 750 kg (1653 lbs).

6.9 C.G. calculation

The actual C.G. can be determined as follows:

For each item, the moment mass x C.G. has to be determined and to be added up and divided by the total mass. See the following example:

1 kg = 2.2046 lbs = .264 US gal.water 0.305 m = 1 ft
 Item mass C.G. behind moment
 datum

	kg	m	m kg
aircraft empty	400	0.74	296.0
Pilot front	75	- 1.35	- 101.25
rear	100	- 0.24	- 24.00
Water ballast in the wings	100	0.243	24.3
fin tank A	4.1	5.032	20.63
fin tank B	12.3	5.160	63.47
Sum	691.4	XS=0.404	279.15

CG=moment/mass

The limits of the inflight C.G. 0.185 m - 0.48 m should not be exceeded!

The most important C.G. positions (behind datum):

Pilot:

The C.G. position is dependent on the pilots shape, mass and thickness of the parachute. The pilot C.G. position can be determined by executing a weight and balance measurement with glider empty and equipped with the pilot etc. see maintenance manual. Please note, that the distance a has to be measured with both configurations, as it may change due to deflection of the landing gear.

The pilot C.G. can be determined by the following equation:

$$XP = (XSF \quad MF - XSE \quad ME)/MP$$

MF = flight mass XSF = flight C.G. MP = pilot mass
 ME = empty mass XSE = empty C.G.

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If the actual pilot C.G. is not known, you have to take the values from the following table:

Pilot mass (kg)	pilot C.G. (m)							
	front cockpit				rear cockpit			
	f	r	f	r	f	r	f	r
110	-1,348	-1,295	-0,277	-0,232	-1,350	-1,296	-0,278	-0,233
105	-1,351	-1,297	-0,279	-0,234	-1,352	-1,298	-0,280	-0,235
100	-1,353	-1,300	-0,281	-0,236	-1,355	-1,301	-0,283	-0,237
95	-1,356	-1,302	-0,284	-0,238	-1,357	-1,303	-0,285	-0,239
90	-1,359	-1,304	-0,286	-0,240	-1,359	-1,304	-0,286	-0,240
85	-1,360	-1,305	-0,288	-0,241	-1,361	-1,305	-0,288	-0,241
80	-1,361	-1,306	-0,289	-0,242	-1,361	-1,306	-0,289	-0,242
75	-1,362	-1,307	-0,290	-0,243	-1,362	-1,307	-0,290	-0,243

Further C.G. positions:

Baggage or battery in baggage compartment:	0.31 m
Instruments in front panel:	- 1.870 m
Instruments in rear panel:	- 0.700 m
Tail wheel	5.345 m
Removable Ballast (Option see 7.16.1):	- 1.920 m
Battery in fin (see sect. 6.8)	5.306 m
Water ballast in the wings	0.243 m
Fin ballast tanks (option)	
Tank A compensation of wing ballast	5.032 m
Tank B compensation of rear pilot	5.160 m

7.16 Miscellaneous equipment (Options)

7.16.1 Removable ballast

The ballast box (Option) at the right hand side of the instrument console underneath the carpet can accommodate 3 lead ballast weights of min 2.2 kg (4.85 lbs) each. Each weight compensates a pilot mass of 2.9 kg (6.4 lbs). With 3 weights 8.7 kg (19.2 lbs) missing pilot mass can be compensated. The lead ballast weights are to be fixed in the box with a M 8 wingnut.

7.16.2 Oxygen system

a) Oxygen bottle installation

Max. size of oxygen bottle is 7 l capacity with diameter 140 mm (5.5 in.)- If a bottle with less diameter is used, this bottle must be wrapped with plastic to come to the same diameter of 140 mm. The bottle must be fixed at its neck with a bracket Z 14 (available at DG-Flugzeugbau GmbH).

b) Installation of the oxygen equipment

To ensure a safe installation ask DG-Flugzeugbau GmbH for an installation instruction. For the installation of the Dräger Höhenatmer E 20088 you will find an installation plan 5 EP 34 in the maintenance Manual.

7.16.3 ELT Emergency Locator Transmitter

To ensure a safe installation ask DG-Flugzeugbau GmbH for an installation instruction. For the Pointer Inc. ELT Model 3000 you will find an installation plan 5 EP 30 in the maintenance manual.

Caution: Concerning 7.16.2 and 7.16.3

The installation of such equipment has to be accomplished by the aircraft manufacturer or by an approved service station and to be inspected and entered in the aircraft log book by a licensed inspector.