

Type certificate number:	ULL – 03 / 2009
Holder of type certificate:	CARBON DESIGN s.r.o.
Hradecká 315, Pražské Předměstí 551 01 Jaroměř	
Type of UL aircraft:	FM250 Vampire
Date of supplement issue:	28.09.2010
Addition a) b):	31.03.2011
Addition c): 14.03.2014, Addition d): 30.11.2016	
Addition e): 19.1.2018, Addition f): 17.01.2019	

TYPE CERTIFICATE SUPPLEMENT No. ULL 03 / 2009

I. General

1. Type designation: **FM250 Vampire**
2. Category: Sport flying equipment, aerodynamically controlled ultralight aircraft
3. Holder of type certificate: **CARBON DESIGN s.r.o** (addition d))
Hradecká 315 Pražské předměstí 551 01 Jaroměř
Producer: **CARBON DESIGN s.r.o** (addition d))
Hradecká 315 Pražské předměstí 551 01 Jaroměř
4. Application date: 17.06.2006
5. Approval date: 25.11.2009

II. Regulations

1. Airworthiness requirements: UL 2-part I., Ultralight aircraft airworthiness requirements, Aerodynamically controlled ultralight aircraft, modified regulations from 17.10.2002.
2. Special conditions: None
3. Exceptions: None

III. Specifications, performance and operational limitations.

1. Type specification: The type is defined by the Type design dated 15.5.2007 and by the drawings No. FM 250-0-01-01 to FM 250-6-04-23, dated until 31.12.2007.

Description: FM250 Vampire is a two seat single engine cantilever low wing UL aircraft with side by side seating. The aircraft has an all composite construction consisting of fiberglass sandwich combined with carbon rowing spars. The wing is of trapezoid shape with main and Real wing spars and is equipped with split landing flaps. The landing flap is of a split type with position 15° and 33°. Tricycle landing gear is of a nosewheel design equipped with hydraulic disc brakes on the main wheels. Main landing legs are composite, front landing wheel is controlled and spring loaded. Tail section has a standard design with horizontal stabilizer in the fuselage axis. Integral fuel tanks are placed in the wings, Equipment: To receive the UL aircraft airworthiness certificate, every produced aircraft must be equipped with basic instruments, in accordance with airworthiness requirements stated in the chapter II. Regulations.

Addition e) Change of flap type from split to plain flap.

2. Basic technical specifications.

Wing span	7.8 m
Length	6.049 m
Height	2.164 m
Wing	
Wing area.....	10,05 m ²
Airfoil	MS 313
MAC.....	1,312 m
Aspect ratio.....	6,054
Wing loading at MTOW.....	450 kg = 44,7 kg/m ² , 472,5 kg = 47 kg/m ²
Aileron length	0,85 m
Aileron area	0,21 m ²
Aileron deflections	up..... 25 ⁰
	down 15 ⁰
Landing flap length	2,2 m
Landing flap area	0,811 m ²
flap deflections	take off split..... 15 ⁰ plain 9 ⁰
	landing split..... 33 ⁰ plain 21 ⁰
Horizontal tail section	
Span.....	2,63 m
Area.....	1,82 m ²
Deflection.....	up 25 ⁰
	down 15 ⁰
Vertical tail section	
Area	0,814 m ² (Addition a) increased to 1,155 m ²)
Deflections.....	+/- .. 19 ⁰
Wheel track.....	1,94 m
Wheel base.....	1,52 m
Wheels dimensions	350 x120 mm
Tire pressure	1,8 + 0,2 kPa
Brakes	hydraulic discs
Main landing gear legs springing	tires, composite landing gear legs Front
landing gear leg springing	Steel spring

3. Weight

Max. take off weight MTOW 450 kg
 MTOW can be exceeded only for the weight of the ballistic recovery system (BRS). MTOW including BRS 472,5 kg

Empty weight 265 kg in basic configuration with engine Rotax 912 without BRS.
 286 kg in basic configuration with engine Rotax 912 with BRS.

Max. useful load 187 kg

Min. weight of the crew50 kg
 Max. weight of the baggage8 kg
 Fuel tank capacity..... 1 x 68 l, optional 2 x 68 l, total 136 l.

4. Performance

The following figures correspond to MSA conditions for the aircraft equipped with :

Engine ROTAX 912 UL (59,6 kW / 80 hp) Propeller

DUC Swirl, 3 blade, diameter 1730 mm.

	Take off weight 472,5 kg
Flight speed CAS:	
Stall speed in landing configuration V_{SO}	63,0 km/h
Stall speed in clean configuration V_{SI} .	78,0 km/h
Max. flap extended speed V_{FE}	120 km/h
Design maneuvering speed V_A	156 km/h
Max. speed in level flight V_H	223 km/h
Never exceed speed V_{NE}	270 km/h
Rough air speed V_{RA}	187 km/h
Take off distance over 15 m obstacle	290 m
Climb rate	5,1 m/sec at 120 km/hod

Engine ROTAX 912 ULS (73,5 kW / 100 hp) Propeller

DUC Swirl, 3 blade, diameter. 1730 mm.

Climb rate	6,09 m/sec at 120 km/h
Max. speed in level flight V_H	232 km/h
Take off distance over 15 m obstacle	270 m

5. Center of gravity (CG) limits:

Forward CG limit: 24 % MAC

Aft CG limit: 34 % MAC

Datum: Wing leading edge is the datum

Mean aerodynamic chord: MAC=1,312 m

MAC is 127 mm away from the leading edge of the wing
 root airfoil:

6. Load factors

Maximum positive / negative+4,0 / -2,0.

7. Engine:

Rotax 912 UL or Rotax 912UL S

Operational engine limitations:

Rotax 912 ULS:

Maximum take off power 73,5 kW/ 5800 min⁻¹ (for 5 minutes)

Maximum continues power 69 kW/5500 min⁻¹

Rotax 912 UL:

Maximum take off power 59,6 kW/ 5800 min⁻¹ (for 5 minutes)

Maximum continues power 58 kW/5500 min⁻¹

8. Propeller and limitations: Type: **DUC Swirl**

Producer: DUC Helices, France

Description: on the ground adjustable, composite, 3- blade.
Diameter: 1730 mm.

Type: **FITI ECO COMPETITION 3LR 158**

Producer: FITI design s.r.o.

Description: on the ground adjustable, composite, 3- blade.
Diameter: 1580 mm.

Type: **Křemen SR 200** (Addition f))

Producer Woodcomp s.r.o.

Description: on the ground adjustable, wooden, 3- blade.
Diameter: 1680 mm

Type: **Peszke AS 1730/1950**

Producer Peszke S.C.,

Description: on the ground adjustable, laminated, 3- blade.
Diameter: 1730 mm

Addition a): Type: **SR 3000 / 2W**

Producer: Woodcomp s.r.o.

Description: in flight adjustable, mixed construction, 2- blade.

Diameter: 1625 to 1750 mm

Addition c): Type: **KA-2/5-PA**

Producer: Kašpar a synové- Strojírna Kalmar s.r.o.

Description: in flight adjustable, mixed construction, 3- blade.

Diameter: 1720 mm

9. Fuel:

EUROSUPER RON 95 lead free accord. to DIN 51607,Ö-NORM 1100 AVGAS 100 LL.

BA 95 Natural is recommended for the Czech Republic.

10. Oil:

Rotax 912: oil classification API SF(SG) or higher, intended for use in 4-cycle motorcycles (with additives for gear lubrication)

IV. Operations and maintenance documents

- FM250 Vampire flight manual
- ROTAX 912 user manual
- Propeller technical specifications and operational instructions
- BRS user manual (if aircraft is equipped with BRS)
- Optional equipment manuals

V. Additions:

Addition „a“ / 31.3.2011: Fuselage modification – trade name **FM250 Vampire II**

FM-250 Vampire II originates from the FM-250 Vampire. The fuselage length is now 6,232m, which is longer comparing to the previous model. It is due to moving the engine mount 100mm forward and changing the vertical tail section shape. Engine cowling has been reshaped slightly and was modified to accommodate the engine mount. In spite of all mentioned modifications, the CG position remains in the original range.

Vertical tail section has also been re-shaped. The change is mainly cosmetic, leading edge of the new shape of vertical tail now forms a different angle with longitudinal fuselage axis. Vertical tail section area has changed to 1,155m² from the original 0,814m². All above modifications have not changed flight characteristics and controllability of the aircraft comparing to the previous model.

Besides the previously used propellers, the aircraft will now also use type Woodcomp SR3000/2W. The CG range with this propeller remains within the permitted range. Flight tests confirmed that climb ratio has increased and max. horizontal speed V_h was not exceeded.

Engine: remains Rotax 912 UL or 912 ULS as originally mounted, according to the type certificate.

Addition „b“ / 31.3.2011: Glider airtows up to 520 kg

Max. Strength of the towing rope weak link 300daN +/- 30 daN.

Max. Weight of the towed glider 520 kg.

Min. Speed during towing 110 km/hod.

Max. Rate of climb at the speed 120 km/hod.

Max. Speed during towing 156 km/hod (or according to glider).

Tow plane must comply with regulations of the Supplement III of the regulations UL-2 / section I. (additional requirements for UL tow planes). Procedures and limitations for airtows are included in the flight manual supplement.

Addition „c“ / 14.3.2014: Glider airtows up to 750 kg

Maximum weight of glider airtows is increased to 750 kg, other data are identical to the addition b). Using of propeller KA-2/5-PA (more detail in Section III./8.)

Addition „d“/ Change of type designation from FM - 250 Vampire to FM250 Vampire and a change of the type certificate holder CARBON DESIGN s. r. o.

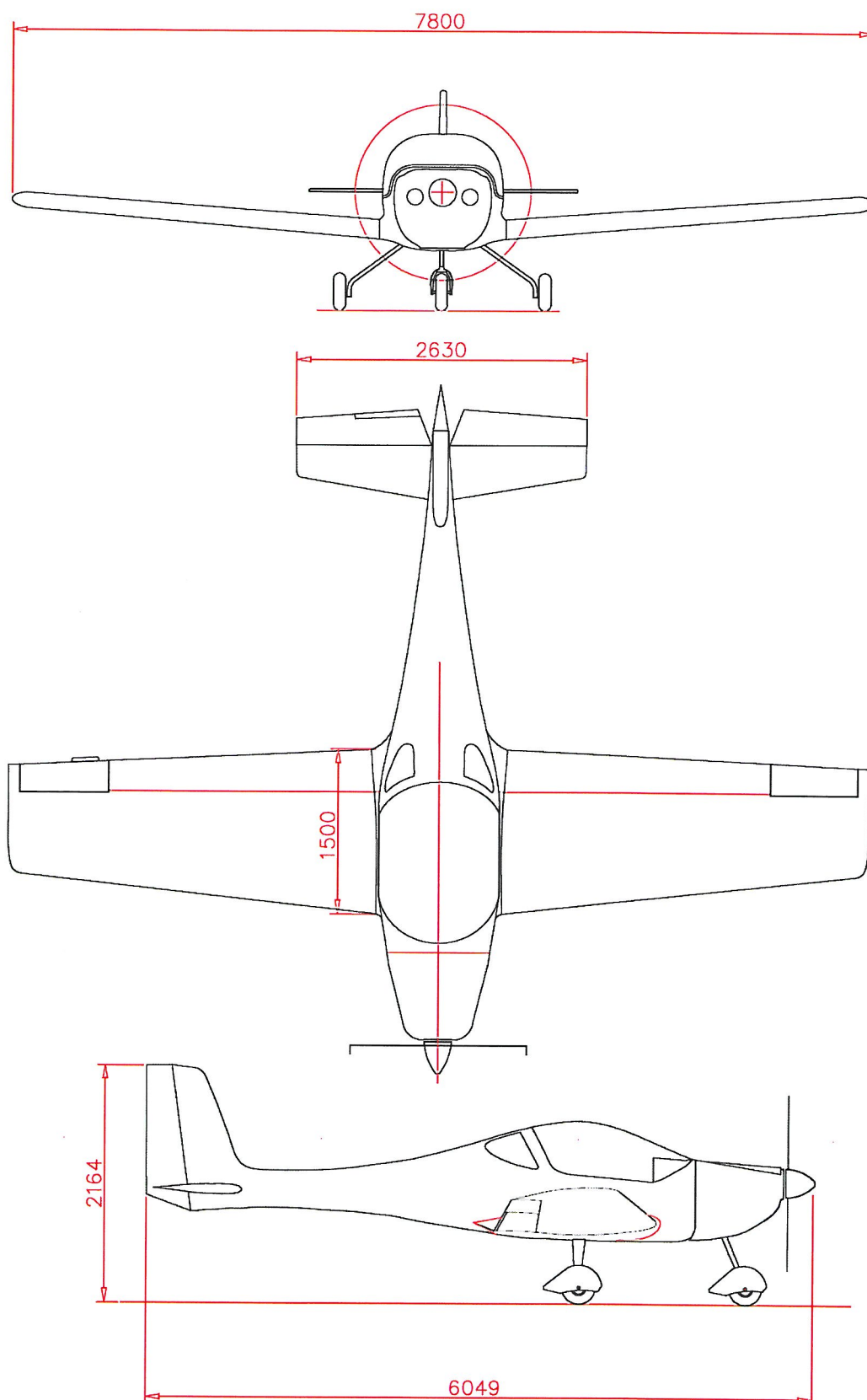
Addition „e“/ Change of flap type from split to plain flap.

Addition „f“/ Corrections of propeller data in point III/8. of the supplement
(SR 2000, 3000 to SR 200)

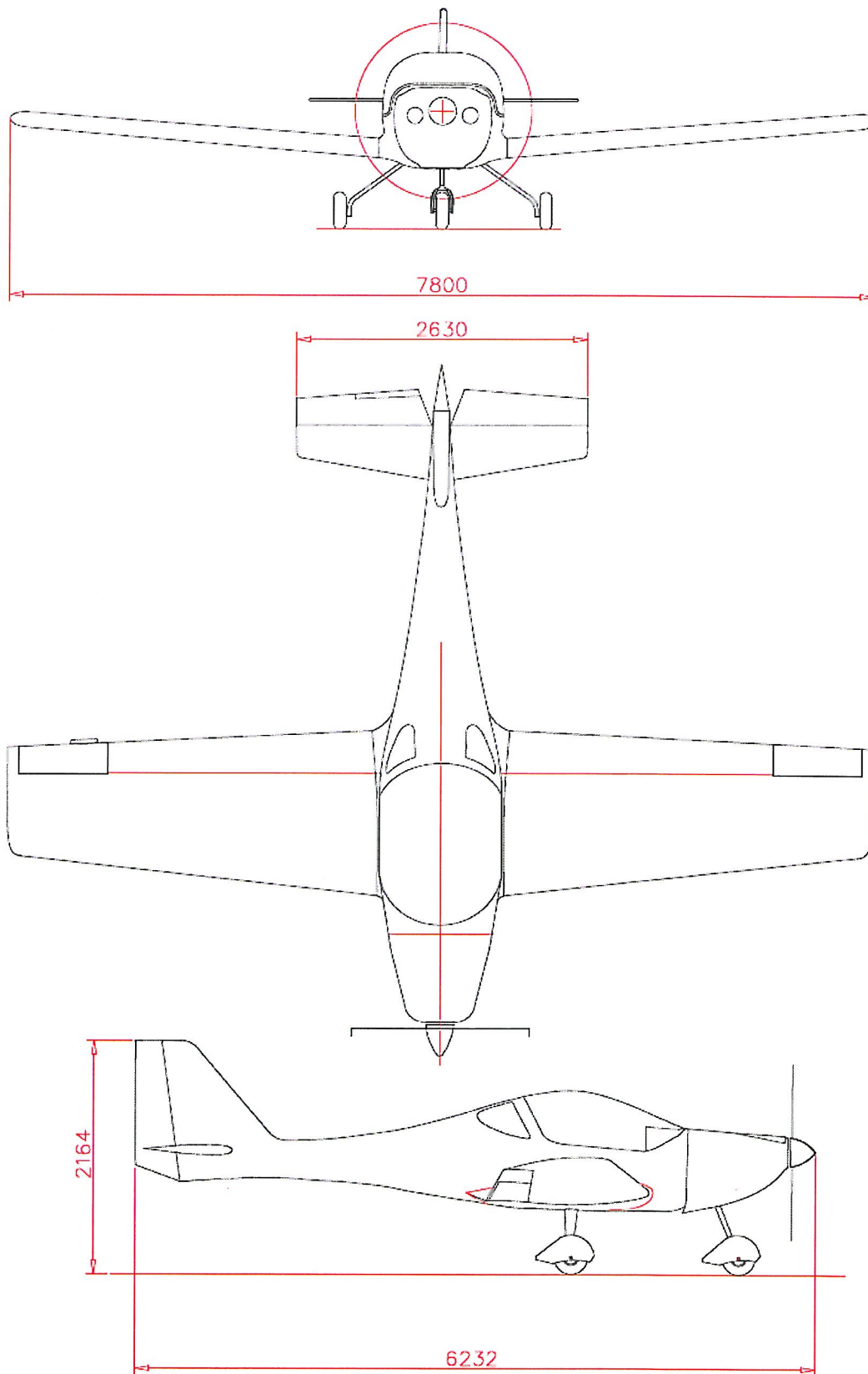
Notes: 1. Every aircraft applying for the UL airworthiness certificate must have Weight and balance protocol which contains list of the equipment of the specific empty aircraft.

2. The aircraft must be equipped with placards and signs listed in the Flight manual.

UL aircraft technical drawing : FM250 Vampire

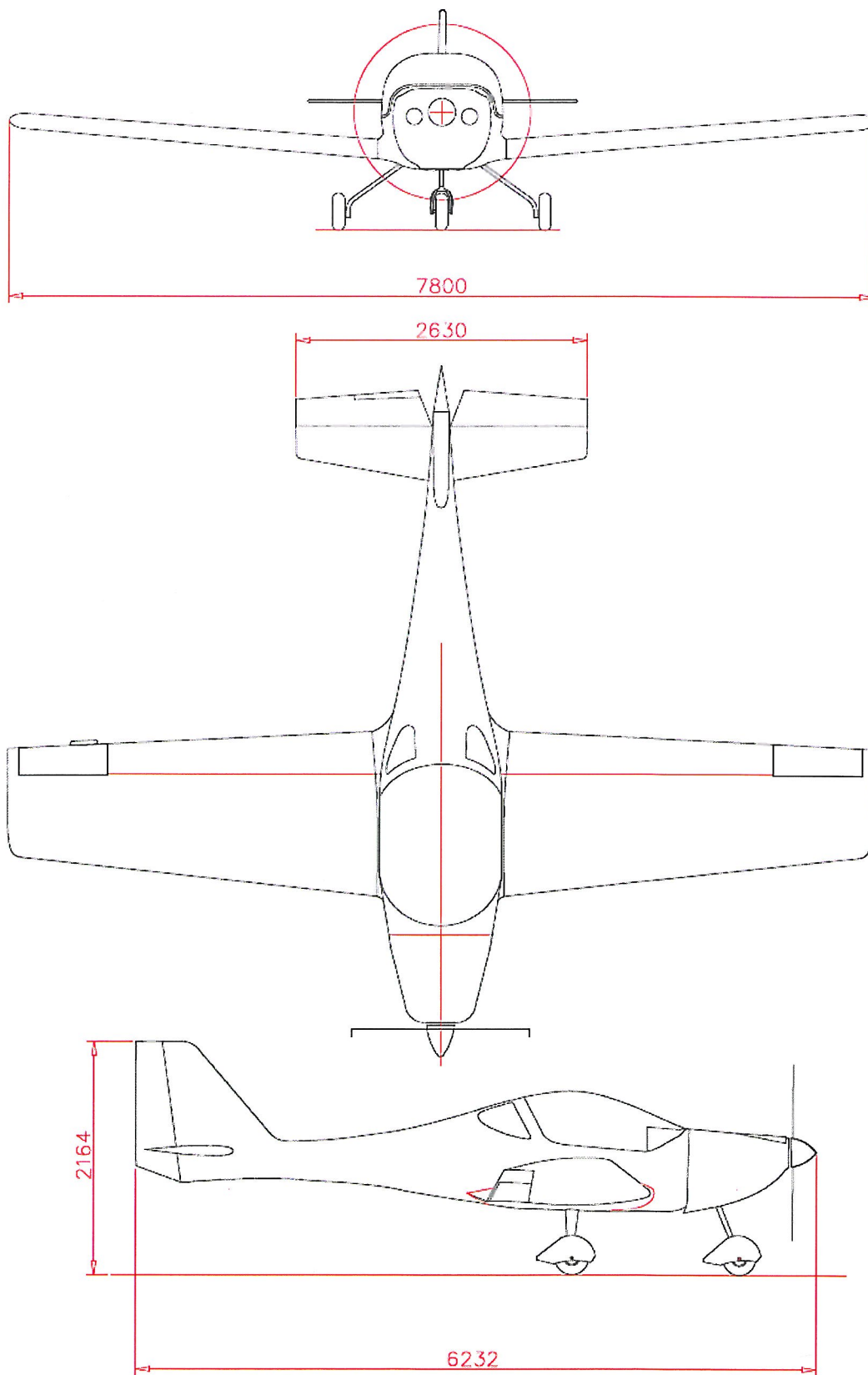


UL aircraft technical drawing : FM250 Vampire II



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UL aircraft technical drawing : FM250 Vampire II



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