027/2024

User Manual

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Belmont

DW200

SIA Smart Aero

Identification Form: **PH-0D6**

Serial number: **027/24**

This aircraft must be operated in accordance with the instructions, specifications and limitations contained herein.

It's implementation is subject to compliance with the legal provisions applying to Ultralight powered aircraft in the country of operation.

0.2 Contents

SECTION 0

0. GENERAL

0.1 Record of Revisions

0.1 Record of revisions

Any revisions to this manual must be recorded in the following table:

Revision No.	Section concerned	Amended pages	Revision date	Approved by
Initial issue			13.04.23.	Ronalds Berzins
Revision No. 1	Neuform propeller		01.11.23.	Ronalds Bērziņš
Revision No. 2	Section 6	51-59	15.11.23.	Ronalds Bērziņš
Revision No. 3	Wing luggage compartments	21; 61	02.04.24.	Ronalds Bērziņš

SECTION 1

1. GENERAL INFORMATION

1.1 Introduction

User manual is part of each Belmont- DW200. It is supposed to provide all information necessary to operate and maintain the airplane. This airplane has been designed in compliance with LTF- UL 2020 regulations describing the operations and maintenance of sport flying equipment.

1.2 Warnings and Precautions

The following definitions apply to cautions, warnings and notes in the user manual.

WARNING

Means that non observance of the corresponding procedure leads to an immediate or significant degradation of flight safety, either to injury or death or airplane destruction.

CAUTION

Caution to situations that may result in injury or damage of the airplane.

PRECAUTION

Means that non observance of the corresponding procedure leads to a minor or possible degradation likely to affect long- term flight safety.

REMARK

Draws attention to a particular point not directly related to safety but provides important or unusual information.

1.3 Technical Characteristics

1.3.1 Aircraft Description

Belmont DW- 200 is an ultralight aircraft essentially intended for leisure, travel and/ or training, excluding any aerobatic flying.

Belmont DW- 200 is an all metal, side by side, single engine, two seat ultralight, low wing UL airplane. It is equipped with a fixed tricycle landing gear with steerable nose wheel connected to rudder pedals.

1.3.2 Power Plant

Standard version of Belmont DW- 200 is equipped with Rotax 912 ULS 2 engine. Engine has 4 cylinders, 4 strokes with a maximum power of 73. 5 KW (100 Hp), and E-Props propeller (172 cm) or Neuform Propeller (170 cm)

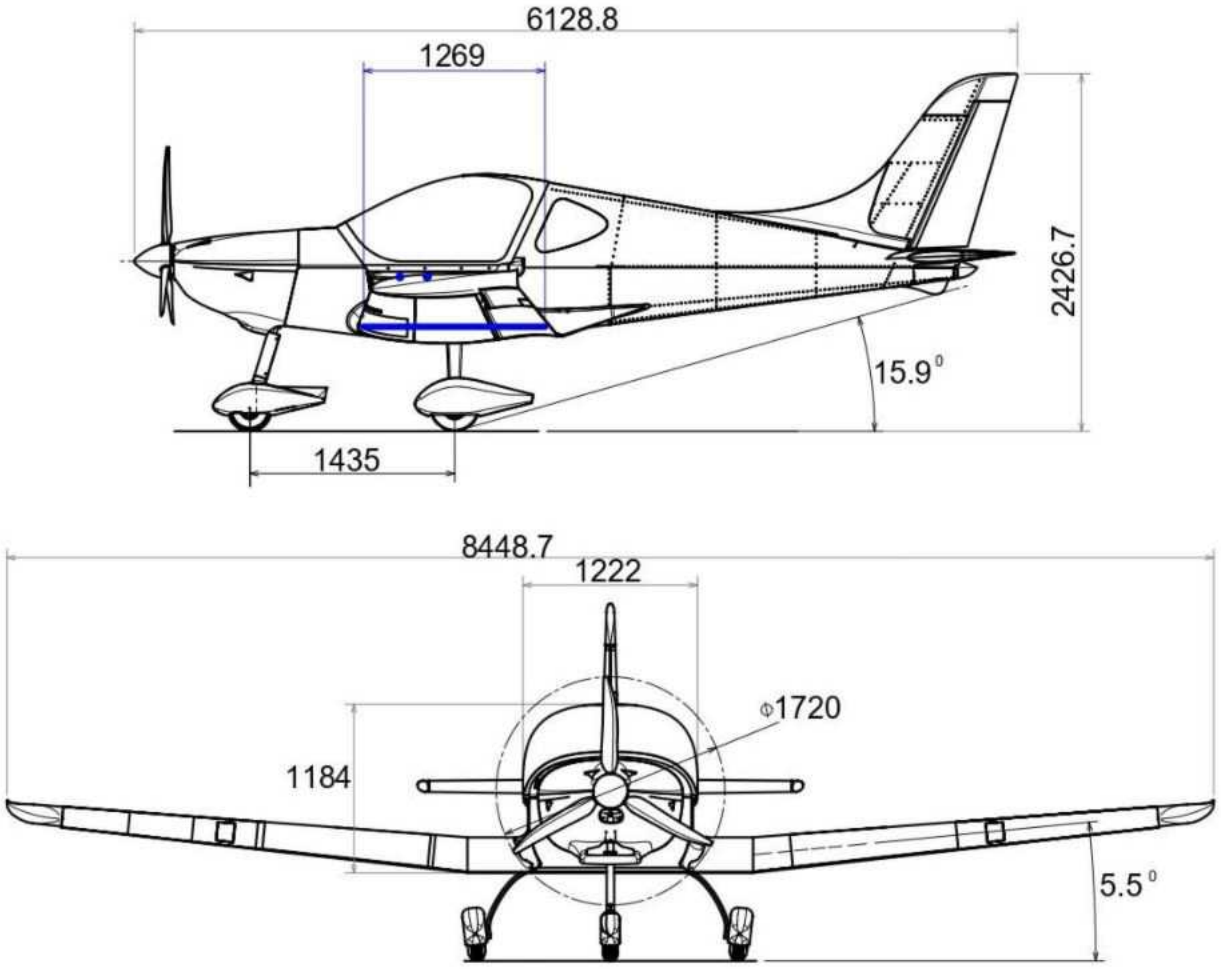
1.3.3 Dimensions

Wingspan - 8,45 m
Length - 6, 10 m
Height - 2,37 m
Wing area - 10, 38 m^2
Cabin width - 1,25 m

1.3.4 Control Surfaces Travel Range:

Rudder: ± 31,4°
Elevator: + 25°/- 15°
Ailerons: + 20°/- 14°
Flaps: 10°(take-off setting), 25°and 30° (landing setting)

1.3.5 5 Plan View and Dimensions



1.4 Definitions and Abbreviations

ATC	Air traffic control
ASI	Airspeed Indicator
BEACON	Anti- collision beacon light
CAS	Calibrated Airspeed
COMM	Telecommunication transmitter
CoG	Center of Gravity
EFIS	Electronic Flight Instrument System
ELT	Emergency Locator Transmitter
EMS	Engine Monitoring System
°F	Temperature in degrees Fahrenheit
Ft	Foot / feet (1 Foot = 0,3049 m)
Ft/ min	Feet per minute
GPS	Global Positioning System
hp	Power unit (Horse Power)
IAS	Indicated Airspeed
IC	Intercom
IFR	Instrument Flight Rules
in	Inch
ISA	International Standard Atmosphere
knot	NM per hour
lb	Pound Pound = 0,45359 kg)
MAC	Mean Aerodynamic Chord
max.	Maximum
min.	Minimum or minute
mph	Miles per hour (mph = 1609 m/hour)
NM	Nautical Mile
OFF	System off or element in rest position
ON	Power on or element in on position
OAT	Outside Air Temperature
POH	Pilot Operating Handbook
psi	Pound per square inch
rpm	Revolutions per minute
sec.	Second
US gal	Volume unit (1 US gal = 3,78 L)
VFR	Visual Flight Rules

VMC	Visual Meteorological Conditions
V_A	Maneuvering speed
V_{FE}	Maximum flaps extended speed
V_{NO}	Maximum cruising speed
V_{NE}	Never exceed speed
V_{SO}	Stall speed in landing configuration (flaps extended)
V_{S1}	Flaps retracted (clean configuration) stall speed
V_X	Best angle of climb speed
V_Y	Best rate of climb speed
V_B	Maximum speed at which gust will not overly stress the aircraft
Vh	Maximum speed in level flight at maximum continuous power
Vf	Designed flap speed
Vsf	Stall speed with flaps extended
V_{ra}	Speed at which it is safe to fly the airplane into turbulent conditions without causing damage

SECTION 2

2. LIMITATIONS

2.1 *Introduction*

Section 2 includes operating limitations, instrument markings and basic parameters necessary for the safe operation of the aircraft, it's engine, systems and standard equipment.

2.2 *Airspeed Limitations*

Limiting speeds and their meaning are shown below:

Speed		*IAS(Km/h)*	Remarques
V_{NE}	Never exceed speed	***247***	Do not exceed in any circumstances
V_{H}	Maximum cruise speed (structural)	***223***	Do not exceed this speed except possibly in calm air and with caution
V_{A}	Maneuvering speed	***181***	At speeds exceeding the maneuvering speed, full deflection of any flight control surface can result in damage to the aircraft structure.
V_{FE}	Maximum flaps extended speed	***125***	Never exceed this speed with flaps extended

2.3 *Anemometer Marking*

Marking of airspeed indicator is shown below:

Speed		*IAS (Km/h)*	Remarks
V_{NE}	Never exceed speed	*247*	Do not exceed in any circumstances
V_{H}	Maximum cruise speed	*223*	Do not exceed this speed except possibly in calm air and with caution
V_{RA}	Maximum speed in turbulence	*200*	Never exceed this speed in turbulence
V_{A}	Maneuvering speed	*181*	At speeds exceeding the maneuvering speed, full deflection of any flight control surface can result in damage to the aircraft structure.
V_{F}	Design flap speed	*142*	Maximum Speed that the planes flaps are designed to operate at
V_{FE}	Maximum flaps extended speed	*125*	Never exceed this speed with flaps extended
V_{SF}	Stall speed with flaps extended	*75*	Stall speed with flaps extended
V_{S0}	Stall speed with flaps	*75*	Minimum steady flight speed in landing configuration
V_{B}	The maximums Gust speed	*200*	The maximum speed at which a gust will not overly stress the aircraft
V_{S1}	Stall speed without flaps	*86*	Minimum steady flight speed
V_{Y}	The speed for best rate of climb	*120*	The speed at which plane has the best performance in ascent
V_{X}	The speed of best angle of climb	*104*	The speed at which best angle of climb is achieved

Air speed indicator markings:

Color	IAS (km/h)	Remarks
White arc 1,1 Vso - Vfe	83-125	Operating range with flaps extended
Green arc 1,1 Vs1 - Vra	95-200	Normal operating range
Yellow arc Vra - Vne	200-247	Maneuver with caution and in still air conditions.
Red mark One	245	Never exceed speed

2.4 Power Plant

2.4.1 Engine Performance and Limitations

WARNING

PILOT IS OBLIGED TO CHOOSE THE PATH IN A WAY THAT IT IS POSSIBLE TO PERFORM SAFE EMERGENCY LANDING IN CASE OF LOOSE POWER. PILOT IS FULLY RESPONSIBLE FOR THE CONSEQUENCES

Engine model		**ROTAX 912 ULS**
Manufacturer		**Bombardier- Rotax GMBH**
Power	***Max take-off***	**98,6 hp at 5800 rpm, max.5 min.**
	Max continuous	**92,5 hp at 5500 rpm**
	Cruise	**68,4 hp at 5000 rpm**
Engine speed (RPM):	***Max lift off:***	**5800 rpm, max. 5 min.**
	Max. continuous:	**5500 rpm**
	Cruise:	**5000 rpm**
	Idle:	**~1400 rpm**
Cylinder head temperature:	***Minimum:***	**50 °C**
	Maximum:	**120 / 135° C ***
	Optimum:	**80 - 110° C**
Oil temperature	***Minimum:***	**50° C**
	Maximum:	**130° C**
	Optimum:	**80 - 110° C**
Oil pressure	***Minimum:***	**0,8 bar *- below 3500 rpm***
	Maximum:	**7 bar - when starting cold engine**
	Optimum:	**2 - 5 bar *- above 3500 rpm***

* The maximum cylinder head temperature depends on the type of coolant used. – Refer to section 2.4.4. and section 10 supplement No.2

2.4.2 Neuform Operating Limitations

Various loads have an effect on the propeller during the operation. The loads consist of bending loads due to thrust and the power applied, centrifugal forces and gyroscopic loads. They basically depend on the number of revolutions and on the power with which the propeller is operated:

Maximum Allowable propeller Rotational Speed	N max = 2600 min^{-1}
Maximum Allowable Engine Power	73.5 kW
Life Limitations	So far though no problems in connection with ageing or fatigue have become known, so the time of use is not restricted to a flat rate. However, it is absolutely necessary to carry out the Factory Overhaul in order to guarantee a safe operation.
Aerobatics	Aerobatics cause higher loads to the propeller. This propeller has not been tested for aerobatics. That's why aerobatics are not allowed.

2.4.3

Fuel

Usable fuels:
(Refer to the engine user manual)

- min. RON 95, EN 228 Premium, EN 228 Premium plus, AVGAS100LL

  Note: Due to higher lead content in AVGAS, the wear of the valve seats, depositing in combustion chamber and lead sediments in the lubrication system will increase. Therefore use AVGAS only if you encounter problems with vapor lock or if the other fuel types are not available.

- Per FAA Standard specification – automotive Spark ignition Fuel or AVGAS 100 LL
- Fuel to DOT Standard – CAN /CGSB-3.5 Grade 3 min 91 AKI or AVGAS 100LL, 93 Octane automotive fuel.

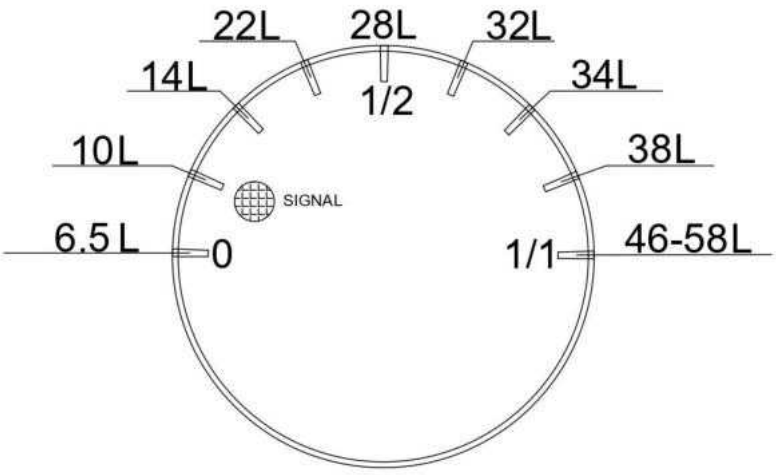
Fuel Tank capacity:

Wing tanks ..... *2x60 liters*
Total Unusable fuel. 0.25 *liters*

WARNING

Beware of the amount of fuel. Comply with aircraft weight and center of gravity limitations not to exceed the maximum weight and/ or Center of Gravity (CoG) limitations.

NOTE: *Although wing tanks capacity is 60L, it's recommended to fill only 58L to avoid overflow.*



2.4.4 Lubrication

Useable oil:

(Refer to the engine user manual)

Use only motorcycle oil containing gearbox additives classified API '' SG'' or higher. Never use aircraft oil. The use of a non- mineral multigrade oil is recommended.

NOTE: *The Type of oil recommended by the manufacturer is listed in Section 10 supplement No. 2*

Oil circuit capacity:

Minimum ..... 3,24 liters
Maximum ..... 3,6 liters

2.4.5 Coolant

Type of liquid:

(Refer to the engine user manual)

50% Concentrated antifreeze with anticorrosion additives and 50% pure water or equivalent pre- mixed liquid. The conventional glycol/ water coolant mixture can also be used, it limits the reaching of the maximum authorized cylinder head temperature.

NOTE: *The type of coolant recommended by the manufacturer is indicated in Section 10 Supplement no. 10*

Cooling circuit capacity:
Approximately ..... 3 liters

2.5 Markings of Engine Instruments

Markings of analogue engine instruments and their color code are shown below

Rotax 912ULS *100 hp*	**Minimum limit (red line)**	**Normal operating range (green line)**	**Transient operation (Yellow line)**	**Maximum rpm (Red zone)**
Rotation speed [RPM]	1400	1800 - 5500	5500 - 5800	5800
Oil temperature	*50 °C (122 °F)*	*70 - 110 °C (122 - 230 °F)*	*110 - 130 °C (230 - 266 °F)*	*130 °C (266 °F)*
Exhaust gas temperature (EGT)	-	*800 - 850 °C (1472 - 1562 °F)*	*850 - 880 °C (1562 - 1616 °F)*	*880 °C (1616 °F)*
Cylinder head temperature (CHT)*	50 ° C *(122 °F)*	50 - 110 °C *(122 - 230 °F)*	110 - 120 / 135 °C * *(230 - 248 / 275 °F)*	120 / 135 ° C * *(248 / 275 °F)*
Oil pressure	*0,8 bar (12 psi)*	*0,8 - 5 bar (12 - 73 psi)*	*5 - 7 bar (73 - 102 psi)*	*7bar (102 psi) Cold start*

* The maximum cylinder head temperature depends on the type of coolant used – Refer to section 2.4.4. and section 10 Supplement No. 2

2.6 Markings of Miscellaneous Instruments

Note: *Not applicable*

2.7 Mass

Reference empty weight (standard version) 310 kg

REMARK

Current aircraft empty weight is defined in section 6

Maximum take- off weight (with rescue system) - 600 kg

Maximum take-off weight (without rescue system) - 577.50 kg

Maximum mass of fuel - 90 kg

Maximum mass in rear luggage compartment - 15 kg

Maximum mass in wing luggage compartment - 13 kg

Minimum pilot weight - 70 kg

WARNING

Beware of the amount of fuel. Comply with aircraft weight and center of gravity limitations. Never exceed maximum take- off weight and/ or Center of Gravity (CoG) limitations.

2.8 Center of Gravity

Center of Gravity (CG) range *23.3 to 36.0 %* MAC

2.9 Authorized Maneuvers

UL aircraft category:

Belmont DW-200 is compatible with the normal maneuvers listed below:

- Bank angle not exceeding 60°
- Static stalls (except triggered)

WARNING

Aerobatic maneuvers and intentional spins are prohibited

2.10 Limit Load Factors

Clean configuration or with flaps extended -2g to +4 g.

2.11 Crew

Number of seats 2
Minimum crew ..... 1 pilot in the left or right seat
Minimum pilot weight ..... 70 kg
Maximum crew mass ..... See section 6

WARNING

Never exceed the maximum take-off weight of 600 kg

2.12 Aircraft Usage

Only day VFR Flights are authorized.

WARNING

IFR Flights and intentional flights in icing conditions are prohibited!

Minimum Equipment and Instruments for VFR Flights

- Airspeed indicator -
- Slip indicator
- Altimeter
- Vertical speed indicator (VSI)
- Compass
- Fuel gauge
- Tachometer (RPM)
- Oil temperature
- Oil pressure
- Cylinder head temperature (CHT)

2.13 Other Limitations

Heavy rain or high humidity may decrease performance. During the flight in these conditions increase the airspeed by 10km/h.

Smoking onboard is prohibited.

SECTION 3

3. Emergency Procedures

3.1 Introduction

Section 3 provides checklists and suitable emergency procedures for dealing with various emergency situations that may arise. Emergencies caused by aircraft or engine malfunctions are rare if proper pre-flight checks and maintenance procedures are performed correctly. However, in the event of an emergency the basic guidelines outlined in this section should be considered and applied to resolve the situation.

3.2 Engine Failures

3.2.1 Engine Failure During Take - off roll

1. Throttle - **IDLE**
2. Ignition - **OFF**
3. Main switch - **OFF**
4. Brakes - **AS REQUIRED**

3.2.2 Engine Failure on Take - off

1. Airspeed - 110 km/h
2. Select place for landing:
   - Below 150 ft: ahead (in path) if possible.
   - Above 150 ft: Any suitable runway if possible
3. Ignition - OFF
4. Fuel valve - CLOSED
5. Flaps - RETRACTED and trim
6. Main switch - OFF
7. Safety belt - TIGHTEN
8. Brakes - after touch down AS REQUIRED

3.2.3 Engine Failure in Flight

1. Airspeed - reduce to 110 km/h
2. Trim - AS REQUIRED
3. Flaps - AS REQUIRED
4. Choose landing area without obstacles
5. Landing area - Choose suitable place (without obstacles)
6. Ignition - check ON
7. Main switch - check ON
8. Fuel valve - check ON
9. Engine restart - CONSIDER/ CONTINUE
10. Emergency landing - CONSIDER

3.2.4 In Flight Engine (re)start

1. Airspeed - 130 km/h
2. Main switch - ON
3. Fuel valve - OPEN
4. Throttle - SET 1/3 FWD (IN)
5. Ignition - ON
6. Starter - START

3.2.5 Sudden Engine Overspeed

1. Throttle - Reduce immediately (in order to keep engine rpm below max rpm)
2. Airspeed - Reduce to Take-off airspeed
3. Land - At the next possible airfield

NOTE: *Due to a mechanic low – pitch limit inside the hub it is ensured that there will remain enough thrust to continue flight safely but slower and on an unusual high rpm level.*

3.2.6 Unestimated Low Engine Rpm

1. Throttle - Keep in a position that ensures level flight, full throttle if Necessary
2. Speed - Fly preferably at cruising speed
3. Land - At the next possible Airfield

REMARK

In case of missed approach and go around, keep in mind that there will be unfamiliar low (but sufficient) climb performance

NOTE: *Due to a mechanic high – pitch limit inside the hub it is ensured that there will remain enough thrust to continue flight safely but on an unusual low rpm level.*

3.3 Smoke and Fires

3.3.1 FIRE on Ground

1. Fuel valve - CLOSED
2. Throttle - FULL FWD (full throttle)
3. Ignition - OFF
4. Main switch - OFF
5. Leave the aircraft (evacuate)
6. Use fire extinguisher or call fire brigade if you are unable to extinguish the fire.

3.3.2 Engine FIRE on Ground (engine running)

1. Heating - CLOSED
2. Fuel selector (Fuel valve) - CLOSED
3. Throttle - FULL FWD
4. Ignition - OFF
5. Leave the aircraft (evacuate)
6. Use fire extinguisher or call fire brigade if you are unable to extinguish the fire

3.3.3 Engine Fire on Take - off

1. Throttle - IDLE
2. Fuel valve - CLOSED
3. Near airfield - Speed 115 km/h and LAND asap.
4. Brakes - as required to full stop
5. Full stop -
6. Ignition - OFF
7. Leave the aircraft (evacuate)
8. Use fire extinguisher or call fire brigade if you are unable to extinguish the fire

3.3.4 *Engine Fire in Flight*

1. Fuel valve - CLOSED
2. Throttle - FULL FWD (full throttle)
3. Airspeed - INCREASE – try to ''blow out'' the fire, do not exceed Vne
4. Consider LAND ASAP - select nearest airfield or other suitable landing area
5. Ignition - OFF
6. Airspeed - 110 km/h
7. Flaps - As required, trim
8. Master switch - OFF
9. Safety belts - tighten
10. Perform emergency landing
11. Leave the aircraft (evacuate)
12. Extinguish the fire or call fire services.

REMARK

It may take up to 30 seconds for fuel remaining in the carburetor to be consumed

WARNING

Do not attempt to restart the engine!

3.3.5 *Cockpit FIRE*

1. Main switch - OFF
2. Heating - CLOSED
3. Use onboard fire extinguisher or call fire brigade

3.4 Glide

Gliding flight following an engine failure:
Recommended airspeed for gliding = 113 km/h

3.5 Landing Emergencies

3.5.1 Emergency Landing

An emergency landing is generally carried out in the event of an engine failure when it cannot be restarted in flight.

1. Speed - adopt optimal glide speed IAS 120 KM/H
2. Trim - adjust
3. Harnesses/ belts - tighten
4. Flaps - as needed
5. ELT - send a position report (if installed)
6. Fuel selector (valve) - closed
7. Ignition - OFF
8. Main switch - OFF
9. Maneuver with care without excessive bank and land on the chosen surface.

3.5.2 Precautionary Landing

A precautionary landing is generally carried out in the event of insufficient fuel reserve or deteriorating weather conditions.

1. Choose landing area and determine wind direction
2. Report your position and your intentions (if the aircraft is equipped with adequate equipment)
3. Carry out a low pass over the right part of the chosen area, facing into the wind and flaps extended, if necessary, in order to thoroughly inspect the landing area.
4. Evolve locally on the chosen terrain and prepare an approach circuit.
5. Perform the approach with power with full flaps
6. Completely reduce power when flying over the threshold of the pitch in preparation for a touchdown from the start of the chosen zone.
7. After the aircraft has stopped, turn off all ignitions, close the fuel valve, lock the aircraft and call for assistance

REMARK

Never take your eyes off the chosen area during precautionary landing

3.5.3 Landing With a Deflated or Flat Tire

1. On landing, delay contact of the damaged wheel with the ground as much as possible by using aileron control
2. Maintain the axis and counter the yaw by appropriate action on the rudder pedals.

3.5.4 Landing With Defective Landing Gear.

1. If the main landing gear is damaged, perform touchdown at the lowest possible airspeed and if possible, maintain centerline when executing the landing.

2. If the nose wheel is damaged perform touchdown at the lowest possible airspeed and hold the nose wheel above the ground using the elevator control for as long as possible.

3.6 Exiting an Involuntary Spin

WARNING
VOLUNTARY SPINS ARE PROHIBITED!

The aircraft has no natural or uncontrollable tendency to enter a spin when normal flying techniques and procedures are applied.
Technique for recovering from an involuntary spin:

1. Throttle lever - reduce fully
2. Side control - ailerons at neutral
3. Steering control - foot opposite to rotation
4. Rudder - return immediately to neutral as soon the spin stops
5. Depth control - forward sleeve to as stop rotation, then perform a fflexible resource progressive

3.7 Other Emergencies

3.7.1 Vibration

If abnormal vibrations occur:

1. Find and operate the engine at a speed at which vibration is lowest
2. Land at the nearest aerodrome or execute a precautionary landing as described in 3.6.

3.7.2 Sudden Extreme Vibration due to loss of parts of blades (i.e., due to impact of foreign material, bird strike)

1. Cut off the engine and land in gliding flight immediately.

3.7.3 What happens in Case of Neuform propeller constant speed regulator System Failure? (H)

In the case of a failure of the control system, the propeller turns back into '' take-off'' position. Should that happen during fast cruising, this may result in very high engine speed. Reduce throttle to avoid excessive engine speed! Reduce airspeed!

3.7.4 What happens in case of control system failure? (ECS-M)

In the case of control system failure, the pilot must switch to Manual -mode and check whether the propeller can thus be handled. If that is the case, set the '' take-off'' position of the propeller manually (RPM-INC/DEC-Switch).

If the propeller control unit fails to work entirely, the propeller will stay in its last position. That may lead to drastically reduced climbing performance. Choose your flight path accordingly! However, if the propeller was properly installed, there is, even at an extreme cruising setting, still a minimum climbing performance left, in accordance with the Airworthiness Requirements, in Germany for example according to LTF UL 2003: 1,5 M/S. Please take into consideration at landing that there is less performance Available than usual for go-around/touch-and-go should it become necessary!

Should the mechanical connection between electric drive and propeller fail, the propeller will move to the setting of the smallest possible climbing position. Should that happen during fast cruising, this may result in very high engine speed. Reduce throttle to avoid excessive engine speed! Reduce airspeed to take off speed!

NOTE: *The narrowest possible setting angle is mechanically limited within the hub. It is technically impossible to narrow this limited angle any further. This means that even in a worst-case scenario the propeller will still perform at maximum climbing performance. Zero-, let alone reverse thrust, will not occur.*

3.7.5 Carburetor Icing

Carburetor icing can be suspected in case of decrease in engine power and an increase in engine temperature. To recover engine power, the following procedure is recommended.

1. Speed - As needed, min. 120 km/h
2. Throttle- set 1/3 FWD (power)
3. Leave icing conditions (if possible)
4. Gradually increase power to cruising setting after 1-2 minutes

If you are unable to recover engine power, land at the nearest airfield (if possible) or depending on the circumstances perform a precautionary landing as described in 3.6.

WARNING

If your engine is equipped with a carburetor heat system, turn it on for extended descent and in potentially icing conditions.

Reminder: the aircraft is intended for use in VMC conditions only!

WARNING

NEVER OPERATE IN KNOWN OR FORECASTED ICING CONDITIONS

SECTION 4

4. NORMAL PROCEDURES

4.1 *Introduction*

Section 4 provides checklists and recommended procedures for normal operation.

4.2 *Assembly and Disassembly*

Refer to the Belmont DW-200 Assembly manual.

4.3 *Preflight Check*

Carry out preflight inspection before each flight and/ or after assembly of the aircraft. **Incomplete or careless preflight checks can cause an accident.** Perform the inspection following the instructions in the inspection checklist described below.

4.4 *Constant Speed Control Operation (''Control ECS-M'')*

Operation is performed through the propeller control unit ''Flybox PR1-P'' in the cockpit. The propeller control unit controls the electric spindle drive for infinite adjustment of the propeller blade angle.

The control unit knows two working conditions:

During **MANUAL** – mode the servo motor can be reached directly through the RPM-INC/DEC-switch. As the propeller is operated manually in this condition, chapter a) applies. Operation can be performed similar to the manual control version. However, the MANUAL-mode should only be used in case of malfunction or ambiguity. Standard operation is performed in **Constant speed-** mode.

During **Constant Speed-**mode, constant speed control is operational. The pitch of the propeller is automatically set to the engine speed the pilot requires. This is done by comparing the required speed (below in the display) with the actual speed (above in the display).

Therefore, the main function of the propeller control unit is to keep the engine speed required by the pilot as steady as possible.

REMARK

The word ''condition'' in the instructions means a visual inspection of the surface, deformations, damage, scratches, friction, corrosion damage or any other defect which may lead to a deterioration in flight safety. The inspection of the power plant and it's peripheral systems is an integral part of the preflight check.

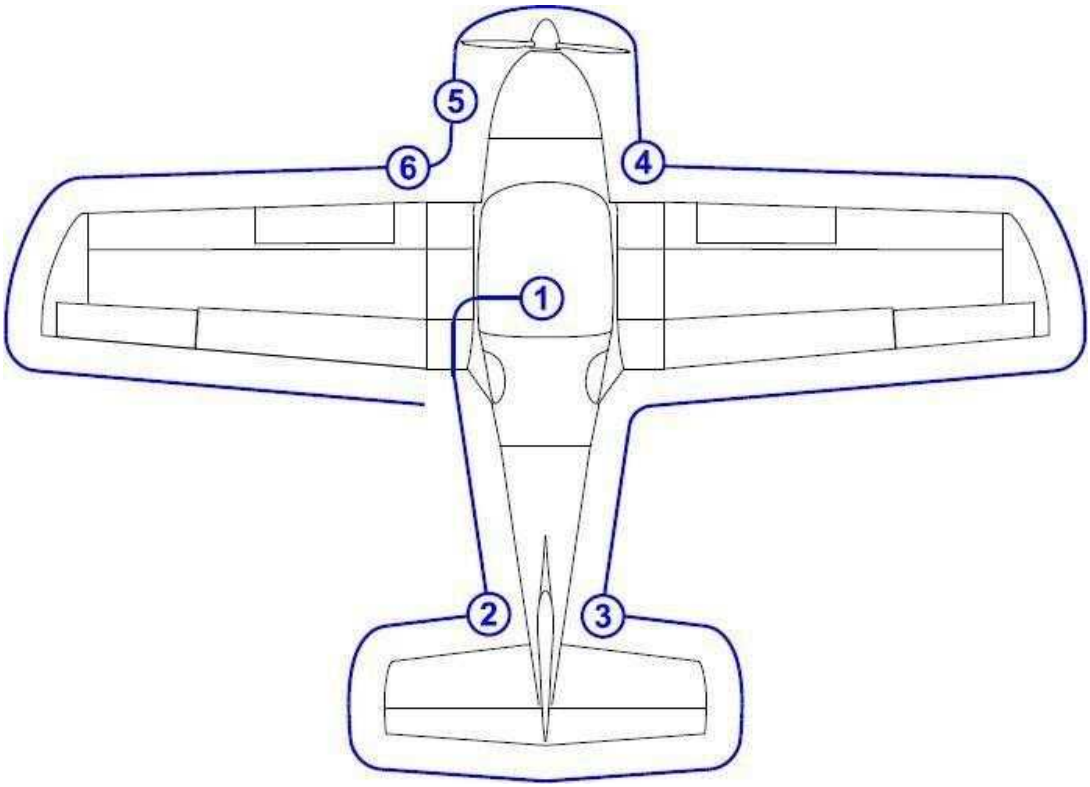
WARNING

IF IN DOUBT, DO NOT OPERATE THE AIRCRAFT. SEEK ADVICE FROM QUALIFIED ENGINEER

WARNING

Never operate the propeller on ground while persons or animals are close. The pilot is responsible for keeping the propeller within its operation limitations any time.

Manufacturer recommends:



Inspection Check List

①	– Ignition - OFF – Main switch - ON – Fuel gauge(s). - Quantity verify – Main switch - OFF – Instruments - Check – Controls - Visual inspection, operation, check for free travel - Verification of proper functioning of flaps – Canopy - Condition of fasteners, cleanliness – Check that there are no moving objects in the cabin
②	– Condition of the engine silent blocks – Propeller Hub free of Cracks – Are all blades and all screws tight (visual check)? – No damage of the propeller blade composite fabric – No cracks in the blade surface – No blade tip play (refer to ''note'' below) – Propeller and spinner, condition, fixings, cleanliness – Condition of the engine mount and the exhaust manifold – Sufficient oil and coolant levels – Visual inspection of the fuel circuit and electrical circuit wires – Bleeding (leakage) the fuel circuit – Other actions required according to the engine manual
③	– Surface condition of the wings (intrados, extrados) – State of the leading edges – State of the pitot tube
④	– Wing tips - Surface condition – Ailerons - Surface condition, mounts, Free travel and without hard points – Flaps - Surface condition, mounts, Free travel and without hard points
⑤	– Landing gear - Mounts of wheels, brakes, condition and tire pressure – Condition of the fuselage
⑥	– Vertical Tail - Surface finish, bindings, free travel stops – Horizontal Tail - Surface finish, bindings, free travel, depth stops
	– The verification of the left side of the fuselage and the wing is identical to that of the right side

NOTE: *Blade tip play itself is not dangerous but it lowers the service life of the bearings and thus ought to be put right immediately.*

Checking for Blade Tip Play

Hold two of the blades tight with the hands and try to move them towards or away from each Other. A discernible, evenly soft deformation caused by the elasticity of the blades is normal.

Any uneven deformation is an indication of blade tip play.

In the case of blade tip play, contact your NEUFORM service partner.

CAUTION

Any manipulation of the bearing settings must under all conditions only be performed by authorized Neuform – Service - Staff

CAUTION

If the tightening torque for propeller is too high or too low, this may damage the screws!

CAUTION

In the event of long-term parking, it is recommended to manually stir the propeller (ENSURE CONTACTS ARE OFF!!!) This operation will facilitate the starting of the engine.
Always handle the propeller with the palm of the hand on the upper surface of the blade and not only by the cutting edge of the trailing edge.

WARNING

Visually and physically check the actual fuel level in the tanks to ensure you have enough for each flight.

CAUTION

The Neuform Constant speed propeller must be taken out of operation if cracks in the blades or the hub or any other damage to the fabric occur. In all cases of doubt the operation has to be terminated as well. Intensive wear of the integrated leading edge however is allowed and does not impair further operation as long as the fiber fabric beneath is not yet visible.

4.5 Normal Procedures

4.5.1 Before Engine Start

1. Control sticks - Free and full travel
2. Canopy - Clean
3. Brakes - ON (full brakes)
4. Safety harness - fastened, tightened

4.5.2 Engine Start

1. Start the engine according to it's owner's manual.
2. Main switch - ON
3. Fuel selector - Open
4. Throttle - IDLE
5. Choke (cold engine) - Pull all the way then gradually decrease after starting
6. Electric pump - ON
7. Starter - Hold active to start the engine

REMARK

The propeller control unit is switched on only after start-up of the engine. As soon as the AUTO-mode is activated, the display will show a pre-set engine speed.

As soon as the engine is warmed-up, a brief propeller-check must be performed. For that, the engine has to be run at a speed of 4000 1/min with the help of the throttle lever.

With the RPM-INC/DEC-switch the set point will be lowered by some hundred rpm; the actual value will have to follow and to be lowered accordingly. In order to end the test, the controller will be simply set back to Constant Speed Mode. The propeller then has to turn back to the original 4000 1/min. If the actual value doesn't follow as required, operational deterioration must be assumed. The aircraft must not take-off and the propeller will have to undergo a technical check.

After successful pre-flight check, the required engine speed is set at the propeller control unit. **As explained above, please refrain from setting an engine speed higher as 5500 1/min.** For any normal case, an engine speed setting of 5024 1/min is absolutely sufficient. For the towing of banners and gliders or for taking off at extremely short runways, an engine speed of 5500 1/min will be ideal.

CAUTION

The starter must be not activated for more than 10 seconds, followed by a 2 min. pause necessary for it to cool down. As soon as it is running, the speed to be reached for proper engine operation is approximately 2500 rpm. Check the oil pressure, which should be rising within 10 seconds. Only increase engine RPM when oil pressure has reached 29 psi (2 bar) and is stable. To avoid dynamic overloads, start the engine with the throttle at idle or set to maximum for 10% then wait at least 3 seconds to reach constant engine speed before accelerating again. Ignition switches must be selected one by one during circuit check procedure (only one can be OFF while the other is ON)

CAUTION

For Neuform Constant speed propeller to not exceed the maximum revolution speed of the engine, Neuform manufacturer recommends not to set pre-flight a higher revolution speed than 5500 1/min.

CAUTION

For Neuform Constant speed propeller at start-up of the engine, the propeller lever must be set to the foremost pitch. As soon as the engine is warmed-up, a brief propeller-check must be performed. For that, the engine has to be run at a speed of 4000 1/min with the help of the throttle lever while the propeller lever is in take-off position. Then pull the lever into cruising position. This must cause a significant slowing-down of the engine speed by several hundred revolutions per minute. The precise revolution speed is irrelevant. Then, the propeller level will be brought back into take-off position. Here, the revolution speed will have to correspond exactly with the previous revolution speed. Should no significant lowering of the revolution speed be reached or should the revolution speed at the end of the check not correspond with the previous revolution speed, operational deterioration of the propeller must be assumed. The aircraft must not take-off and the propeller will have to undergo a technical check.

After successful functionality check, the propeller can be brought to the intended take-off position. The propeller should only be set to the foremost pitch/position if full take-off performance is needed, for example at very short runways or for aero plane towing. In most cases, more moderate setting is advisable.

REMARK

Manual control Operation (''Control H'') for Neuform Constant speed propeller is done in several steps via the hand lever in the cockpit. The foremost pitch means '' take-off with maximum engine speed'', the hindmost pitch ''cruising''. Right beneath the hand lever is the release (unlocking device). The lever snaps in at the respective pitch and thus assures a stable setting angle in the chosen position. Release (unlocked), the lever moves back through aerodynamic forces or return spring forward to the '' take-off'' position. Against this reset force, any pitch can be chosen now by easy manipulation.

NOTE: *Generally, the propeller ought to be adjusted by checking the rev counter ONLY and not by the setting of the lever.*

4.5.3 *Warm-up and Engine Checks*

Block the wheels of the main landing gear using chocks before any engine test. Warm up the engine first at 2000 rpm for approximately 2 minutes then continue at 2600 rpm until the oil temperature reaches 50C°. Cooling temperature must not exceed 110C°. The heating period depends on the ambient air temperature. Check both ignition circuits at 4000 rpm for the Rotax 912 ULS engine. The engine RPM drop for each circuit off should not exceed 300 rpm. The max drop in engine RPM between each circuit must be around 120 rpm.

REMARK

Only one circuit at a time must be operated (ON/OFF) during verification.

Carry out a full throttle test to check the maximum power consistent with the propeller data and the engine parameters (temperatures and pressures). Test the acceleration from idle to maximum power. If necessary, allow the engine to cool to 3000 rpm before stopping.

CAUTION

The engine check must be carried out facing the wind and in open area, clear of foreign objects, clean ground (the propeller risks sucking up gravel which can damage the leading edges of the blades.

4.5.4 *Taxiing*

Apply the necessary power and if needed, use the brakes to control movements on the ground. Pay particular attention when the wind force exceeds 20 knots. Hold the control lever in the neutral position or in a position favoring good control of the crosswind.

4.5.5 Before Take - off

1. Altimeter - adjusted, checked
2. Trim - neutral position
3. Switches - ON
4. Canopy - Closed, locked
5. Safety Harness - Tight
6. Fuel selector -Open on selected tank
7. Ignition - contacts ON
8. Flaps -Adjusted according to the chosen configuration
9. Adjustable Propeller -Auto, take-off or manual.

4.5.6 Take - off

1. Brakes - as needed
2. Trim - neutral
3. Flaps - take-off position
4. Main switch - ON
5. Fuel gauges - check amount of fuel
6. Instruments - check
7. Canopy - closed and secured
8. Safety belts - secure-tighten
9. Steering - freedom of movement
10. Runway - Check any obstacles and other potential hazards
11. Radio - Report (transmit)
12. Increase throttle to max power.

WARNING

Take – off is prohibited if:

- Engine operation is unstable
- Engine parameters are beyond operational limits
- The crosswind exceeds the authorized limits (see 5.2.8.)
- Runway is not clear
- NEVER take-off unless each tank has sufficient fuel.

REMARK

For Constant speed Neuform Propeller apply full throttle and up you go. With increasing speed, the Propeller will be setting the appropriate angle without any help from the pilot.

REMARK

For Neuform Constant speed propeller revolution speed changes very little during take-off, so no adjustment of the propeller is necessary until after take-off and the following climb flight a speed of 100 km/h is reached because the engine will not build up too high a revolution speed. Thus, the pilot's full focus can remain on the take-off. Still, the revolution counter ought to be watched carefully. For further increase in speed the propeller setting angle will have to be adjusted by pulling the propeller lever. The best climbing performance is reached at approx. 110-140 km/h, depending on the type of aero plane.

4.5.7 Climb

1. Airspeed for climbing - 110 - 120 km/h
2. RPM - Reduce to max 5500 rpm
3. Instruments - All pressure and temp. indicators within limits
4. Flaps - retract above 50m/150ft
5. Trim - as needed

CAUTION

If oil Cylinder head temperatures are approaching their limits, reduce climb gradient to improve cooling.

4.5.8 Horizontal Climb (Cruise)

Refer to section 5, for recommended cruise settings

1. Level of the airplane
2. Engine PRM - check/ adjust
3. Instruments - check
4. Fuel valve - switch as needed

REMARK

For Neuform Constant speed propeller during cruising, one of the performance settings recommended by the engine manufacturers (see engine manual) can be engaged.

4.5.9 Descent

1. Optimal glide speed - 113 km/ h. Max glide ratio speed.

CAUTION

Avoid longer operation in idle setting of engine. It might cause overcooling and loss of power.

4.5.10 Downwind

1. Throttle - set to horizontal flight
2. Airspeed - 120-130 km/h
3. Engine instruments - check readings
4. Safety belts - Tighten
5. Situation - Cleared for landing
6. Brakes - Check

4.5.11 Base

1. Throttle - adjust for descend
2. Airspeed - 110 – 120 km/h
3. Engine instruments - check readings
4. Flaps - take - off position 1
5. Adjustable Propeller - take - off position
6. Trim - as needed
7. Landing clearance - obtain

REMARK

For Neuform Constant speed propeller put the propeller in ‘’take off’’ position for approach. Please include the item ‘’propeller in take-off position’’ (lever turned forward as far as it will go) with the landing check.

4.5.12 Final

1. Airspeed - 90 - 110 km/h
2. Throttle - As required
3. Engine instruments - Check readings
4. Flaps - Landing position
5. Constant Speed - In take-off position
6. Trim - As required
7. Landing clearance - ensure clear and safe to land

4.5.13 Aborted Landing (go-around)

1. Throttle - Slowly throttle up to max power
2. Airspeed -min 100 km/h before climb
3. Trim - As needed
4. Flaps - take-off position
5. Engine instruments - check readings
6. Flaps - retract at 150ft
7. Trim - as needed
8. Airspeed 110 km/h

4.5.14 Landing

1. Touch down on main gear and maintain nose up attitude
2. If necessary, apply the brakes after touchdown of the front wheel

4.5.15 After Landing

1. Brakes - As needed
2. Engine RPM - Adjust for taxi
3. Flaps - Retract

4.5.16 Engine Shutdown

1. Throttle - IDLE (cool down the engine)
2. Instruments - engine parameters within limits
3. Avionics - OFF
4. Ignition - OFF
5. Circuit breakers - OFF
6. Main switch - OFF
7. Starter - Turn the key to OFF
8. Fuel selector - Closed

CAUTION

Abrupt cooling of the motor must be avoided during operation. This occurs especially during descend, taxiing at low rpm or when immediately shutting down the engine after landing.
In normal conditions, the temperatures are stabilized during descend and taxiing at values allowing the engine to be stopped by switching off the ignition. If necessary, allow the engine to cool to 2500-2750 rpm to stabilize temperatures before shut down.

4.5.17 Aircraft Parking and Securement

1. Check Ignition - OFF
2. Check general contacts - OFF
3. Fuel selector - Closed
4. Parking brakes - tight (if installed)
5. Canopy - closed, locked if necessary
6. Secure aircraft

REMARK

If fitted, the use of the parking brake is only recommended for short periods of parking, between two flights during the day for example. After the final flight of the day or at low ambient air temperatures, the use of wheel chocks are preferable.

REMARK

Use the anchor hooks under the wings and the rear of the fuselage to secure the aircraft. Immobilize the front sector stick by attaching it to the rudder pedals with a strap. Make sure the canopy is properly closed and latched.
Anchoring the aircraft to the ground is essential if it is not equipped with a parking brake.

4.5.18 Flight in the Rain

Heavy rain of high humidity may decrease performance. During the flight in these conditions increase the airspeed by 10 km/h.

SECTION 5

5. PERFORMANCE

5.1 Introduction

5.2 Performance

5.2.1 Calibration and Correction of Anemometric Indications
5.2.2 Stall Speeds
5.2.3 Take-off *Performance (Estimated)*
5.2.4 Landing Distance (Estimated)
5.2.5 Climb Rate
5.2.6 Demonstrated Crosswind Performance
5.2.7 Gliding

5.1 Introduction

Section 5 provides data for calibration of indicated airspeeds, stall speed, take-off performance and additional information. The data presented was obtained from flight tests of the aircraft and it's engine, carried out under good conditions and using ordinary piloting techniques. Unless otherwise stated, the performance stated in this section are valid at maximum take - off weight and under ISA conditions. The performance described in this section relate to aircraft equipped with the ROTAX 912 ULS 100 Hp engine and a three blade E- props propeller – as well as Constant Speed Neuform Propeller as optional equipment. The real performance may vary to those shown below. Performance depends on pilot skills, atmospheric conditions and airplane condition.

5.2 Performance

5.2.1 Calibration and Correction of Anemometric Indications

Flaps extended, landing position

IAS [km/h]	50	60	70	80	90	100	110	120	130	140	150
CAS [km/h]	55	66	75	84	92	100	106	112	118	122	126

Flaps extended, take off position

IAS [km/h]	50	60	70	80	90	100	110	120	130	140	150
CAS [km/h]	65	72	79	86	94	101	110	118	127	136	145

Flaps retracted

IAS [km/h]	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260
CAS [km/h]	87	95	102	110	118	126	133	141	149	157	166	174	182	190	199	207	216	224	233

IAS Indicated airspeed, speed shown on instrument panel
CAS Calibrated airspeed, instrument error and position of pressure sensor calibrated

5.2.2 Stall Speeds

Position flaps	KM/H
0°	86 KM/H
30°	75 KM/H

5.2.3 Take - off Performance (Estimated)

Type of surface	Ground roll distance *[m]*	Passage of 50 ft
TARMAC	90	200
GRASS	110	220

5.2.4 Landing Distance (Estimated)

Type of Surface	Since the Passage of 50 ft *[m]*	Landing Roll (braked) *[m]*
GRASSY	240	120

5.2.5 Climb Rate

Conditions: Max continues power - 5500 rpm Mass– 600kg	**Best rate of climb**	
	Vz (m/s)	***V (km/h)***
0 ft	*4.38 M/S*	*110 km/h*
0 ft	*876 ft/min*	*59 kts*
3000 ft	*3.50 m/s*	*110 km/h*
3000 ft	*700 ft/min*	*59 kts*

5.2.6 Demonstrated Crosswind Performance

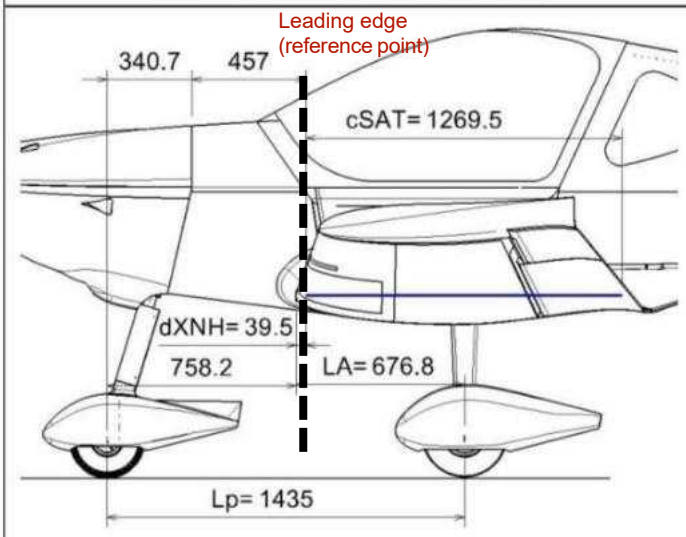
Headwind, maximum speed allowed
for take-off and landing ..... *15 kts*
Crosswind, maximum speed allowed
for take-off and landing ..... *10 kts*

5.2.7 Gliding Speed

Optimum speed for max glide ratio	**113** km/h
Max glide ratio	**k=13:1**

SECTION 6

6. Weight and Balance

Aircraft with nose landing gear	
	**Maximum take of weight = 600kg** **Maximum forward c.g. position =23.3%** **Maximum rear c.g. position = 36%**

c_{SAT} [mm]= 1270 mean aerodynamic chord

dX_{NH} [mm]= 34 mean aerodynamic chord from center of the leading edge

6.1 EMPTY AIRCRAFT WEIGHING INSTRUCTIONS

1 Install 3 weight scales on a flat surface in the hangar. Place level meter on top of right- or left-hand side cabin's wall to determine aircraft level position.

2 Remove all loose items from the aircraft. Prepare an EMPTY aircraft WITH UNUSABLE fuel ONLY (not refueled) and OIL, COOLANT etc., in other words: aircraft in ready for flight condition but without fuel.

3 Move pilot and passenger seats to center position.

4 Reset weight scale to read 0.0 kg prior to placing weight scales under aircraft landing gear.

5 Place Belmont DW200 aircraft on a weight scale (one under nose gear, one under main Right gear and one under Left Main Gear.

6 Install Level meter on right side cabin's wall, ensure aircraft position is levelled.

7 Ensure aircraft does NOT move during all subsequent steps of weighing procedure.

8 Record weight scale readings of an EMPTY aircraft WITH UNUSABLE fuel ONLY (not refueled) and OIL, COOLANT etc., in other words: aircraft in ready for flight condition but without fuel.

Please record weight scale readings in the orange fields below:

Date:		MSN:	
	Mass (KG)	Lever arm (M)	Moment (KPM)
Main Gear LEFT GL		0,677	
Main Gear RIGHT GR		0,677	
NOSE wheel NG		-0,758	
Center of Gravity (M/Mass)			
Lever arm-lead edge AF			
CG ref. To MAC	% of MAC		
MAC 1,270 m	MAC	1,27	
	Lead edge AF	0,034	

Instructions:

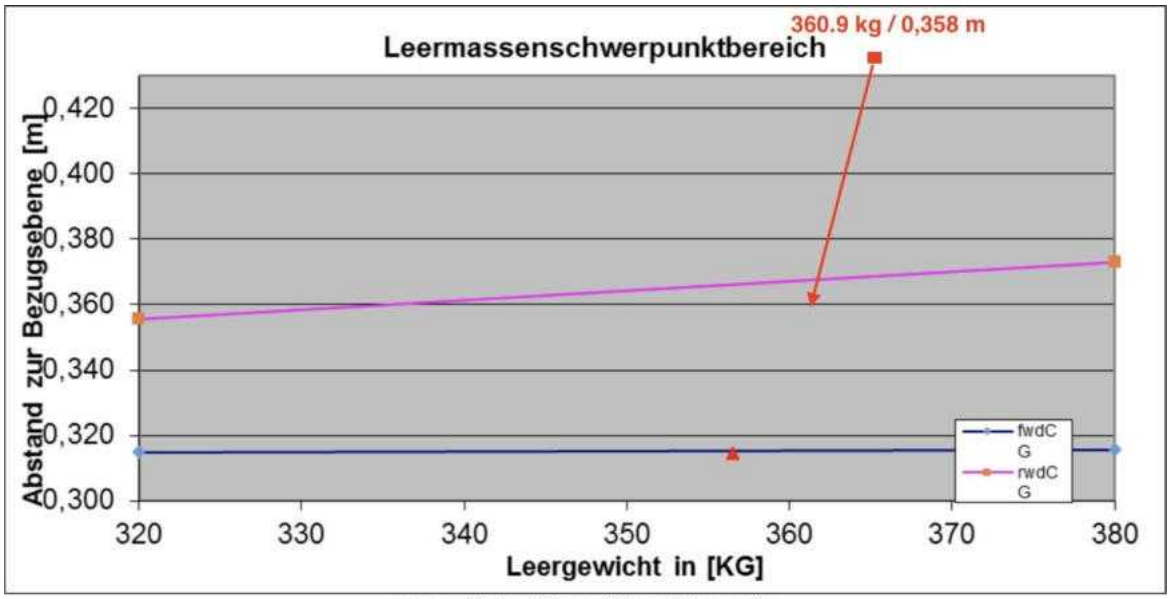
1. Enter (vertically) weight scale readings in the orange fields.
2. Horizontally, multiply Mass KG) x Lever arm (M) to obtain Moment (KPM) – Blue field
3. Add vertically weight data from GL+GR+NG (orange fields) vertically to obtain an empty weight of the aircraft (yellow field)
4. Add vertically Moment (KPM) data (blue fields), to obtain resultant moment (purple field)
5. To obtain Center of Gravity location with reference to wing leading edge (light green field): Total Moment (KPM) / Total Mass (KG)
6. To obtain Center of Gravity location as a percentage of MAC (%):
    - NOTE: distance from wing's leading edge to the start of MAC 0,034M (34mm) – Lead edge AF
    - Subtract from Center of Gravity location (light green field) 0,034m (Lead edge AF), write resultant number in light red field (Lever arm – lead edge AF)
    - CG % MAC = (Lever arm – lead edge AF) x 100 % / 1,27 (Mac)
7. Ensure empty aircraft weight and location of Centre of Gravity (in meters) with reference to wing's leading edge is within the boundaries of a graph 6.1.1 (below)

Example:

	Mass (KG)	Lever arm (M)	Moment (KPM)
Main Gear LEFT GL	*143,1*	0,677	96,88
Main Gear RIGHT GR	*137,5*	0,677	93,09
NOSE wheel NG	*80,3*	-0,758	-60,87
Center of Gravity (M/Mass)	*360,9*	*0,358*	*129,10*
Lever arm-lead edge AF		*0,324*	
CG ref. To MAC	% of MAC	*25,5%*	
MAC 1,270 m	MAC	1,27	
	Lead edge AF	0,034	

NOTE: to ease up calculation, you can contact manufacturer with a request to email excel spreadsheet file.

Table 6.1



... wenn Motorträger 15cm länger ist

Graph 6.1.1

6.2 WEIGHT AND BALANCE CALCULATION BEFORE EACH FLIGHT

1. Enter the following table (Table 6.2) with an empty Mass (KG), Centre of Gravity location (in meters with reference to wing's leading edge) and a total Moment (KPM) of your Belmont DW-200 aircraft (orange fields) - data from Table 6.1
2. Enter actual weight of payload into light green fields (pilot, passenger, fuel, baggage)
3. Lever arm is provided for pilot and passenger seats in the center position. If seats are moved to a maximum forward or maximum aft position (seat travel range 150 mm), adjust lever arm (grey fields) as necessary:

Description	Lever Arm (seats max FWD), m	Lever Arm (seats max AFT), m
Fuel	0,233	0,206
Pilot / Passenger	0,488734	0,651861
Rear baggage compartment	1,251	1,2689
Wing baggage compartment	0,691	0,6413

4. Obtain a Moment (KPM) for each element of payload (pilot, passenger, fuel, baggage) by: Mass (KG) x Lever arm (M)

5. Calculate total Mass (KG) of a loaded aircraft and total moment (KPM) (blue fields) by adding data vertically.

6. To obtain Center of Gravity location with reference to wing leading edge (light red field): Total Moment (KPM) / Total Mass (KG)

7 To obtain Center of Gravity location as a percentage of MAC (%):

- *NOTE: distance from wing's leading edge to the start of MAC 0,034 m (34mm) - Lead edge AF*
- *Subtract from Centre of Gravity location (light green field) 0,034 m (Lead edge AF), write resultant number in light red field (Lever arm - lead edge AF)*
- *CG % MAC = (Lever arm - lead edge AF) x 100% / 1,27 (MAC)*

8 Ensure loaded aircraft Weight and Centre of Gravity is within approved limits.

Calculator before each flight (seats in center position)

Example

Seats in center position	Mass (KG)	Lever arm (M)	Moment (KPM)
Empty aircraft	*360,9*	*0,358*	*129,10*
Pilot	**80**	0,57	45,60
Passenger	**50**	0,57	28,50
Fuel	**50**	0,2195	10,98
Rear baggage compartment (max 15 kg)	**15**	1,26	18,90
L Wing baggage compartment (max 20 kg)	**20**	0,666	13,32
R Wing baggage compartment (max 20 kg)	**20**	0,666	13,32
Center of Gravity (M/Mass)	*595,9*	0,436	*259,71*
Lever arm-lead edge AF		0,402	
CG ref. To MAC	% of MAC	**31,6%**	
MAC 1,270 m	MAC	1,27	
	Lead edge AF	0,034	

Table 6.2

NOTE: to ease up calculation, you can contact manufacturer with a request to email excel spreadsheet file.

6.3 POSSIBLE LOADING SCENARIOS (for information only)

Data provided below was established from weighing a specific aircraft with optional equipment.

WARNING: Please calculate Weight and Balance of your specific aircraft prior to each flight!

A/C Model:	Belmont DW-200 (with Neuform prop)		
MSN:		CoG % MAC	
Aircraft empty weight:	360,9 kg	25,5%	
MTOW:	600 kg	CoG % MAC (seats fully forward)	CoG % MAC (seats fully aft)
Scenario:			
Pilot 70 kg + full fuel load 86kg*	515,5 kg	25,2%	26,6%
Pilot 70 kg + full fuel load 86kg*+ 15 kg rear baggage compartment	531,9 kg	27,2%	28,6%
Pilot 70 kg + full fuel load 86kg*+ 15 kg rear baggage compartment + 2 x 20 kg baggage in each wing's baggage compartment	570,3 kg	29,4%	30,6%
Pilot 90 kg + full fuel load 86kg* + 63 kg pax	599,9 kg	26,7%	29,7%
Pilot 90 kg + fuel load 71kg* + 63 kg pax + 15 kg rear baggage compartment	599,9 kg	28,7%	31,8%

Estimated effect of payload on aircraft's Centre of Gravity location with reference to wing's leading edge (m):

Payload	Seats full **FWD** position	Seats in full **AFT** position
70 kg pilot	1,6%	3,7%
15 kg baggage (rear baggage compartment)	2,5%	2,4%
2 x 20 kg baggage (wing baggage compartments)	2,1%	1,6%
Full fuel load 116 L/86 kg*	-1,9%	-2,6%

Example

Location of aircraft's CoG (% MAC) has moved 2.5% to the aft due an addition of 15 kg baggage into aircraft's rear baggage compartment (pilot and passenger seat in maximum forward position).

Example

Location of aircraft's CoG (% MAC) has moved -1.9% to the forward due to the fact of refueling full fuel tanks.

* - Weight of fuel changes due fuel density and ambient air temperature.

Table for your aircraft:

A/C Model:	Belmont DW-200		
MSN:	……..	CoG % MAC	
Aircraft empty weight:	……..	……..	
MTOW:	600 kg	CoG % MAC (seats fully forward)	CoG % MAC (seats fully aft)
Scenario:			
Pilot 70 kg + full fuel load 86kg*	……..	……..	……..
Pilot 70 kg + full fuel load 86kg*+ 15 kg rear baggage compartment	……..	……..	……..
Pilot 70 kg + full fuel load 86kg*+ 15 kg rear baggage compartment + 2 x 20 kg baggage in each wing's baggage compartment	……..	……..	……..
Pilot 90 kg + full fuel load 86kg* + 63 kg pax	……..	……..	……..
Pilot 90 kg + fuel load 71kg* + 63 kg pax + 15 kg rear baggage compartment	……..	……..	……..

6.4 *OPERATING LIMITATIONS*

For Belmont DW-200 aircraft equipped with E-Prop propeller maximum payload before the flight to prevent aircraft's Centre of Gravity exceeding AFT limit in-flight with both seats in max AFT position:

Max weight of a pilot and passenger	Rear baggage compartment	Wing's baggage compartment
205 kg	NOT USED	NOT USED
130 kg	Max 15 kg	NOT USED
95 kg	Max 15 kg	Max 13 kg in each baggage compartment

NOTE: The above limitation does not apply to Belmont DW-200 aircraft equipped with Neuform propeller.

WARNING: Pilot must ensure individual aircraft's weight and center of gravity remains within the approved operating range during all stages of flight

SECTION 7

7. Aircraft Systems and Equipment

7.1 Introduction

This section provides a description of the aircraft, it's equipment and control systems.

7.2 Skin

The skin is metallic of the ''single skin'' riveted type. The construction is made using 6061 - t6 aluminum sheets assembled on an aluminum angle structure using AVEX rivets. This high strength aluminum alloy design offers both excellent longevity and low maintenance cost due to it 's corrosion resistance characteristics. The wing whose aerodynamic profile provides a high coefficient of lift, is equipped with electrically controlled Fowler flaps

7.3 Controls

Belmont DW200 is equipped with a system of classic double controls. The rudder pedals provide directional control of the nose wheel on the ground. The elevator and aileron trim tabs are electrically controlled from grip sticks.

7.4 Landing Gear

Tricycle train with steerable front wheel combined with spreaders. The main landing gear consists of two flexible blades made of composite material.

7.5 Safety seats and Harnesses

Side by side dual seats feature removable cushions for easy cleaning and drying. Each seat has a four-point safety harness. Available as an option, additional cushions allow the position to be adjusted according to the size of the pilot.

REMARK

Before each flight check that the harnesses are firmly attached to the cell and that they are not damaged. Adjust the buckle so that they are centered on the body.

7.6 Luggage Compartments

7.6.1 Rear Luggage compartment

The rear luggage compartment behind the seats can accommodate up to 15 kg. Make sure that the baggage does not exceed the maximum allowable weight. All luggage must be properly secured.

7.6.2 Wing Luggage compartment

The wing luggage compartment can accommodate up to 13 kg in each wing luggage compartment. Make sure that the baggage does not exceed the maximum allowable weight. All luggage must be properly secured.

7.7 Canopy

Access to the cabin is from both sides.

CAUTION

It is strictly prohibited to open the canopy during a flight!

7.8 Power plant

Engine:

The Belmont Aero Aircraft is equipped with a 100 hp Rotax 912 ULS 2 engine.

The Rotax 912 ULS is a 4 stroke, 4-cylinder flat engine with central camshaft and electronically controlled ignition. Liquid- cooled cylinder heads and air –cooled cylinders. Dry sump forced lubrication system. Dual contactless capacitor discharge ignition. The engine is equipped with an electric starter, an AC generator and electrical fuel pump.

Propeller:

-standard

- On ground adjustable E- Props 172 cm
- Constant Speed Neuform 170 cm

REMARK

For technical data refer to the documentation provided by the propeller manufacturer.

7.8.1 Throttle and Choke Control

Engine power is controlled by means of the throttle. The throttle and choke control levers are positioned on the center console between the seats. The two levers are mechanically connected (by cable) to the carburetor flaps. Springs added to the throttle to keep the engine running at full power in the event of cable breaks.

7.8.2 Carburetor Heater

Control lever on the dashboard

7.8.3 Heating

The heater consists of a heat exchanger on the exhaust manifold. The control is located on the right side of the dashboard.

CAUTION

The penetration of exhaust gases in to the heating or ventilation system can cause fatal accidents due to the inhalation of carbon monoxide. The use of a carbon monoxide detector in the cabin is recommended.

7.9 Fuel Circuit

Wing tank capacity = 2 x 60 liters
Each tank is equipped with a vent and a filter.
The main fuel selector is located on the center cockpit console.
The electric fuel pump is fixed on the firewall.

CAUTION

Do not overfill tanks to prevent overflow through vent tubes. It's recommended to fill 58L to avoid overflow.

7.10 Electrical Circuit

7.10.1 Battery

The battery is installed on the front side of the firewall.

7.10.2 General Contact

The main switch connects the battery to the electrical circuit and to the charging circuit controlled by the regulator. See the engine manual for electrical circuit details.

REMARK

The ignition system is independent of the power source and will operate even with the main switch and /or circuit breaker off.

7.10.3 Ignition Switch

The switch must be in the Both positions to run the engine. For safety, remove the key when the engine is stopped.

REMARK

The direction of activation of the controls and switches is up of forwards for ''on'' except for the starter, the cabin heating and the fuel heater which are pulled for ''on'' position. Optional switches and fuses are subject to modifications installed on demand. See the list of instruments and equipment and the photo of the cockpit.

7.11 Pitot and Static Pressure

A pitot tube is located below the left wing. The distribution of the pressure on the instruments is carried out by means of flexible plastic pipes. The static pressure port is located in the center portion of the wing near rib #1 between the spars keep the pitot tube clean to ensure proper system operation. On some models, an additional two static ports are installed on the rear and left side at the back of the fuselage, for an optional instruments equipment

7.12 Miscellaneous Equipment

- Emergency rescue system
- Double brake control
- Adjustable heater
- Heater
- Wheel fairings
- Protective cover
- Drawbar for front wheel

7.13 Instruments and Avionics

Classic analogue flight instruments:

- *Air speed indicator*
- *Altimeter*
- *Variometer*
- *Slip Indicator*
- *Compass*
- *Trim indicator*

Base Engine instruments

- *Analogue Fuel level gauges (Left and Right) – 52mm*
- *MGL EMS2*
  -Engine RPM
  -Fuel pressure
  -Voltmeter
  -Coolant temperature
  -CHT
  -EGT
  -Oil pressure
  -Oil temperature

REMARK

For instructions on use see the user
Manual supplied with the instruments

SECTION 8

8. AIRCRAFT HANDLING CARE AND MAINTENANCE

8.1 Introduction

This section contains the manufacturer's recommended procedures for ground handling and maintenance of the microlight. It also identifies certain inspection and maintenance rules, which must be respected to maintain it's airworthiness and performance at an optimal level.

8.2 Periodical Inspections

The periodicity of maintenance inspections depends on the type of maintenance and the general condition of the aircraft.

Inspections and overhauls must be carried out within the following schedule at least in the following periods:

a) After the 25 first hours of flights
b) After 50 hours of flights
c) After 100 hours or at least once a year

Refer to the engine manual for engine maintenance. Maintain the propeller according to it's manual. All repairs and maintenance operations must be carried out in accordance with the manufacturers recommendations and the instructions in the maintenance manual.

For Neuform Constant Speed propeller after reaching the Time Between Overhaul (TBO) the propeller must be submitted to a Factory Overhaul at the NEUFORM works or at an authorized Neuform – Service-Partner. To keep a record of the operation time, a flight log must be kept. Any further operation of the propeller after reaching TBO is not permitted! The Time Between Overhaul is defined as follows: 1500 hours of operation or 8 years depending on what occurs first.

Please refer to the Maintenance schedule in the Annex on section 9

8.3 Modifications and Repairs

It is recommended to contact the manufacturer or his representative before any modification of the UL to ensure it's compatibility with the maintenance and it's airworthiness conditions. Use only original manufacturer spare parts (aircraft, engine, propeller)

Any modification carried out without the agreement of the manufacturer is not allowed and is the sole responsibility of the owner of the aircraft and fully releases the manufacturer from it's warranty obligation. Any modification of one or more elements of identification sheet, also leads to the suspension of the ultralight's ability to fly, until the owner has obtained under his responsibility from the applicable Airworthiness Authority, a new certificate of conformity after major modification.

For Neuform Constant Speed propeller minor damage of the colored surface may be repaired by persons with sufficient expertise. The necessary surface resin can be obtained through NEUFORM in small amounts. All other repair of the blades should be made exclusively by NEUFORM. Any exchange of mechanical components can be performed at NEUFORM – Service – Points.

If necessary, it will also be appropriate to update the weight, balance and payload values in Section 6.

8.4 Handling on the Ground

8.4.1 Towing

The UL can be maneuvered on the ground using the drawbar, or from the rear of the fuselage by pushing downwards at the location of a reinforcing bulkhead.

CAUTION

Avoid any excessive pressure on the microlight skin and it's control surfaces. Take all safety precautions, especially in the propeller area.

8.4.2 Parking

It is advisable to park the UL in a hangar or inside in any other suitable space (garage) free of dust, with a stable temperature, good ventilation and low humidity. It is essential to moor the UL when it is parked outside a hangar and during long term parking, to cover the canopy and possibly the entire aircraft by covers.

8.4.3 Tie Down

The UL must be moored when parked outside a hangar after the flight. Lashing is necessary to protect the UL against possible damage caused by wind and gusts. For this reason, the aircraft is equipped with mooring rings located on the lower surfaces of the wings.

Mooring procedure:

1. Checks: Fuel tap closed, circuits and general contact off, Ignition, starter switch off, key removed
2. Secure the controls for example with harness
3. Close the vents
4. Close and lock the canopy
5. Secure ultralight to the ground using a tether passed through the mooring rings located on the lower surfaces of the wings and at the rear of the fuselage.

REMARK

In the event of prolonged parking, especially during winter, it is recommended to cover the canopy or the complete ultralight using a suitable tarpaulin fixed to the skin.

8.4.4 Lifting

After making the device as light as possible, two people should be sufficient to lift it.

Previously prepare two appropriate supports to support the ULM. The device can be lifted using the following support points:

- By pressing on the rear of the fuselage at the location of a reinforcing bulkhead, the forward part of the fuselage can be lifted and supported at the level of the firewall.
- By lifting the rear of the fuselage in line with a reinforcing bulkhead, it can be carried and suspended by this point.
- Only lift a wing by it's main spar area, never lift it by it's tip.

8.4.5 Transport on a Trailer

The device can be transported on a suitable car trailer. Wings must be disassembled before road transport. The ultralight and it's disassembled wings must be ffirmly fixed to protect these parts against possible damage.

8.5 Cleaning and Maintenance

Use only appropriate detergents for cleaning the surfaces of the ultralight. Oil stains (except on the canopy) can be cleaned with gasoline.

The canopy can only be cleaned with warm (not hot) water and a sufficient quantity of suitable detergent (washing liquid or soap). Use a soft sponge and a clean cloth or chamois. If necessary, the use an appropriate polish to remove any scratches.

CAUTION

Never clean the canopy when it is ''dry'' or with petrol or chemical solvents!

The upholstery and removable covers can be removed and brushed or possibly washed in warm (not hot) water with a small amount of detergent. Thoroughly dry the covers before reinstalling in the cockpit

8.6 Neuform Constant Speed Propeller

8.6.1 Cleaning

Propeller and hub must be kept clean at all times to allow for a full sight check during the daily checks. For cleaning water with a bit of washing – up liquid and a soft sponge are recommended. From time to time the synthetic surfaces may be treated with car polish.

8.6.2 Lubrication

There is no set interval for refreshing the lubrication. It is performed if necessary.

Check the state of the lubrication with a simple test. With the electric (ECS) drive the top connecting pin at the setting lever must be removed first, for manual setting (H) no preparation is required.

Hold one of the blades tightly by hand and turn it on its own axis towards a high pitch angle.

8.6.3 Assembly and Adjustment

For assembly and disassembly please refer to the Assembly and Maintenance manual R2-Series

CAUTION

Any assembly of the propeller may only be performed according to ‘’Assembly and Maintenance Manual V3-R2’’ not older than the issue dating 28 April 2010. The manual is exclusively meant for people with the necessary expertise. Although assembly is not very difficult to perform, we strongly recommend that it is only done by professional experts, not by laypersons.

NOTE: *After the first flight after each new assembly of the propeller hub, the tightening torque of the flange bolts must be checked as described in Assembly and Maintenance Manual R2-Series. This is necessary to counteract torque settlement effects.*

SECTION 9

9. Supplements

9.1 Introduction

9.2 List of Inserted Supplements

9.3 Supplements Inserted

9.1 Introduction

This section contains the appropriate supplements to operate the device efficiently and safely when equipped with various systems and optional equipment not supplied with the standard version.

-Please refer to Operating Instructions of Rescue system (if installed).

9.2 List of Inserted Supplements

Date	Suppl. N°.	Tittle of inserted supplement
01/2022	01/2022	Belmont Maintenance Schedule
04/2023	01/2023	Installation of Galaxy Rescue system

Date	Suppl. N°.	Tittle of inserted supplement

9.3 Supplements Inserted

SUPPLEMENT No. 01/2022

Aircraft Maintenance schedule

Belmont DW200	S/ N:	Date:	02,10,20,
	R/ N:	Document no.	SA-01

Consecutive Number	Maintenance	Inspection intervals		
		First 25 hrs	Every 50 hrs	Every 100 hrs
1.	**Engine frame**			
•	Regular maintenance performed in accordance with Rotax Manual	X		X
•	Inspect the engine frame for cracks	X		X
•	Visual check of rubber silent block	X		X
•	Inspect and check for tightening and securing the bolts on the engine brackets and the engine bed	X	X	X
2.	**Engine cowls**			
•	Inspect the cowlings for damage		X	X
•	Visual check of firewall bulkhead, repair damage			X
3.	**Electric wiring**			
•	Check the wiring connection for safety operation	X	X	X
•	Check condition of wiring		X	X
•	Check condition of conductive connection	X		
4.	**Fuel system**			
•	Check if the rubber pipe fasteners are tight enough by tightening with hand	X	X	X
•	Check fasteners and screws for gascolator	X		X

•	If there is dirt in gascolator filter, unmount the gascolator and clean the filter	✕	✕	✕
•	Check if the fuel sender fasteners are tight enough by tightening with hand	✕	✕	✕
5.	**Oil system**			
•	Check the condition of oil cooler, remove if any oil leakage	✕		✕
6.	**Cooling system**			
•	Check for mechanical damage and any leakage	✕		✕
Consecutive Number	Maintenance	Inspection intervals		
		First 25 hrs	Every 50 hrs	Every 100 hrs
•	Check the hoses and tubes of the systems, its attachment, reliability and leakage.	✕	✕	✕
7.	**Exhaust system**			
•	Inspect the whole exhaust system for cracks and weld if any	✕	✕	✕
•	Remove the source of any atypical pollution of the exhaust surface	✕		✕
•	Carefully inspect the welded parts	✕	✕	✕
8.	**Heating system**			
•	Check bowdens for functionality	✕		✕
•	Check heating flap for functionality	✕		✕
•	Check for any damage of the heating system, if damaged repair	✕		✕
9.	**Main Landing gear**			
•	Check for any damage to the fuselage connection	✕	✕	✕
•	Check the connection bolts	✕	✕	✕
10.	**Front Landing gear**			
•	Check securing of bolts	✕		✕
•	Check the shock absorber	✕	✕	✕
11.	**Wheel covers**			
•	Check the fasteners	✕	✕	✕
•	Check safety wires	✕		✕
•	Check for any damage and repair if needed	✕		✕
12.	**Front Wheel**			

•	Check wheels for free rotation	✖		✖
13.	**Front Wheel tyre**			
•	Check the condition and replace if damaged	✖		✖
14.	**Main wheel tyres**			
•	Check the condition and replace if damaged	✖		✖
Consecutive Number	Maintenance	Inspection intervals		
		First 25 hrs	Every 50 hrs	Every 100 hrs
15.	**Main wheel tires**			
•	Check for damage and deformation	✖		✖
16.	**Brakes**			
•	Check function of brakes and parking brake	✖		✖
•	Check the condition of brake pads	✖		✖
•	Check the brake disk for corrosion and cracks	✖		✖
•	Check brake fluid leakage	✖		✖
17.	**Wing**			
•	Check condition and attachment t of wing tips	✖		✖
•	Check condition of the position lights	✖		✖
•	Visual check for any damage.	✖	✖	✖
•	Wing fuel tanks must be checked for any leakage	✖		✖
•	Check the wing connections to the fuselage.	✖	✖	✖
18.	**Flaps**			
•	Check for free movement	✖	✖	
•	Check hinges	✖	✖	✖
•	Check for deformation and damage by fully extending flaps	✖	✖	✖
19.	**Flaps Control**			
•	Check symmetric deflection of flaps	✖	✖	✖
•	Check the functionality	✖	✖	✖
•	Check the hinges	✖	✖	✖
•	Check flaps all three positions. 10°; 25°;30°.	✖		✖

	(+/- 2° offset is acceptable)			
20.	**Ailerons**			
•	Check for free movement	X	X	X
•	Check hinges	X	X	X
Consecutive Number	Maintenance	Inspection intervals		
		First 25 hrs	Every 50 hrs	Every 100 hrs
•	Check if there is any deformation or damage	X	X	X
21.	**Ailerons and elevator control**			
•	Check if all joints are secured	X	X	X
•	Check if it travels freely from one side to another	X	X	X
•	Check the condition of control system	X	X	X
22.	**Rudder control**			
•	Check the free travel	X	X	X
•	Check if all joints are secured	X		
23.	**Fuselage**			X
•	Check the antennas condition	X		
•	Check for deformation or damage of fuselage skin	X		X
24.	**Canopy**			
•	Check if the canopy locker is functional	X	X	X
•	Inspect the canopy for cracks and scratches	X		X
•	Free of movement in rails	X	X	X
•	Inspect the canopy glass for cracks and scratches	X		X
25.	**Horizontal tail unit**			
•	Check elevators free travel from one position to another	X	X	X
•	Check elevators bearings functionality	X	X	X
•	Check elevators bearings fasteners	X	X	X
•	Check for any deformation or damage	X		X
•	Check end tips for damage or cracks	X		X

26.	**Vertical tail Unit**			
•	Check connections	✖	✖	✖
•	Check tail unit for any deformation or damage	✖	✖	✖
Consecutive Number	Maintenance	Inspection intervals		
		First 25 hrs	Every 50 hrs	Every 100 hrs
•	Check end tips for damage or cracks	✖	✖	✖
•	Check free travel from one side to other	✖	✖	✖
27.	**Instrument panel**			
•	Check if the panel is mounted properly	✖		✖
•	Check if instruments are functional	✖	✖	✖
•	Check if the labels are readable			✖
•	Check if control levels are functional	✖	✖	✖
28.	**Propeller blades**			
•	Regular maintenance performed in accordance with the propeller manual	✖	✖	✖
•	Check for any damage on blades surface	✖	✖	✖
•	Check if free movement meets the manual criteria	✖	✖	✖
29.	**Spinner and head of the propeller**			
•	Dismantling the spinner	✖		✖
•	Check for any deformation or cracks	✖		✖
•	For propellers with adjustable blades check the correct setting of propeller angle	✖		✖
•	Check if the screws meets the manual criteria	✖	✖	✖
30.	**Neuform Propeller**			
•	Remove spinner cap	✖		✖
•	Clean properly thoroughly	✖		✖
•	Perform daily checks	✖		✖

•	Check The tightening torque of the flange bolts. Do not unscrew to do that. The correct tightening torque is 27 Nm. Use calibrated torque wrench.	X		X
31.	**Seat belts**			
•	Check the condition	X		X
•	Check the fasteners	X		X
32.	**Pilot and passenger seats**			
•	Check the condition of upholstery	X		X
•	Check the functionality of movability	X		X
Consecutive Number	Maintenance	Inspection intervals		
		First 25 hrs	Every 50 hrs	Every 100 hrs
33.	**Ventilation system**			
•	Check cleanness and passage of air inlet holes	X		X
•	Check line and integrity of the ventilation system hoses	X		X
34.	**Pitostatic system**			
•	Check pitot tube attachment	X	X	X
•	Check cleanness of air inlet holes of pitot tube	X	X	X
•	Check function of the pitot tube		X	X

SUPPLEMENT No. 01/2023

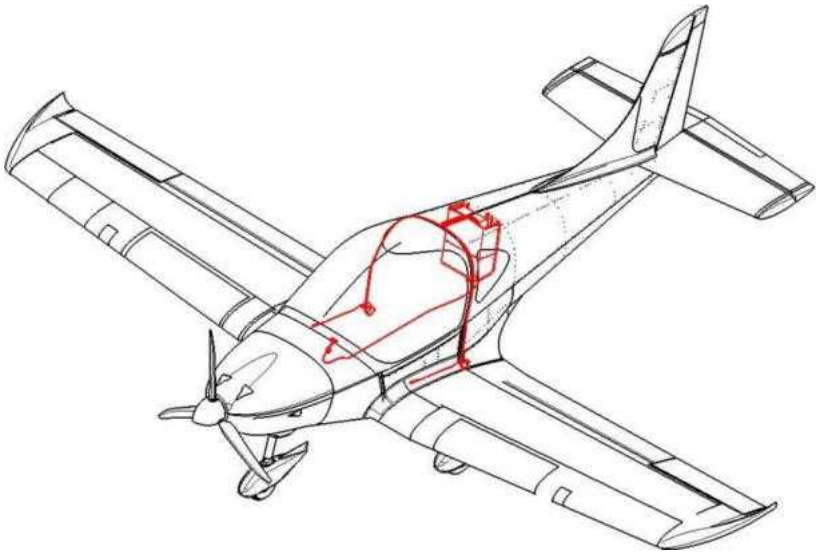
Installation of Rescue System

SUITABLE GRS SYSTEM:	GRS 6/600 SD Speedy	SOFT B9/R	ASTM
	GRS 6/600 SD Speedy DULV B9… ...180 x 270 x 440 mm	SOFT B9/R	DULV certified

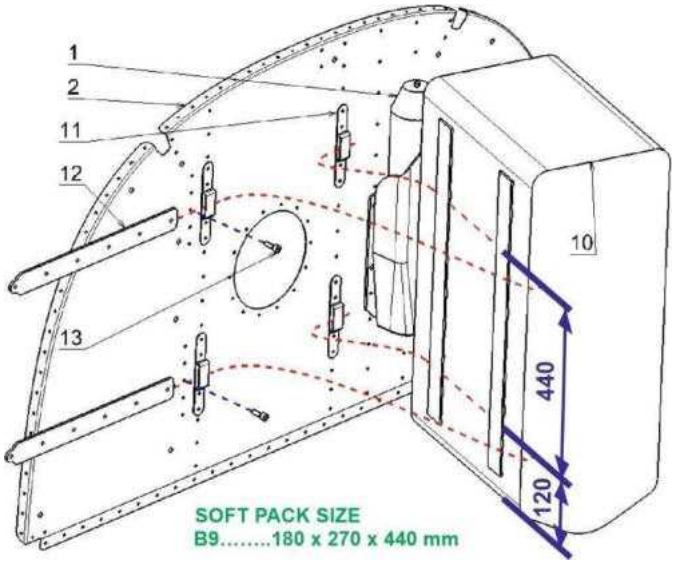
ACTIVATION BOWDEN LENGTH: 3,10 m (reach position on the center of instrument panel)

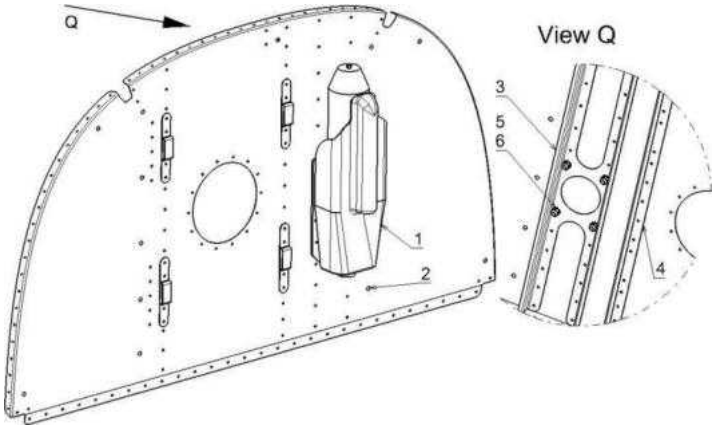
GRS SYSTEM DESCRIPTION: Parachute is packed in sleeve, pressed inside fabric container. Rocket is attached separately on the rear bulkhead beside left side of bag. Rocket bridles exit the rocket on the top side. Parachute bag is attached on the aircraft structure by 2x metal strap, which are inserted through the fabric loops prepared on the bag. Parachute is installed in the location behind seats, oriented for vertical deployment. Whole system is covered by metal sheet cover.

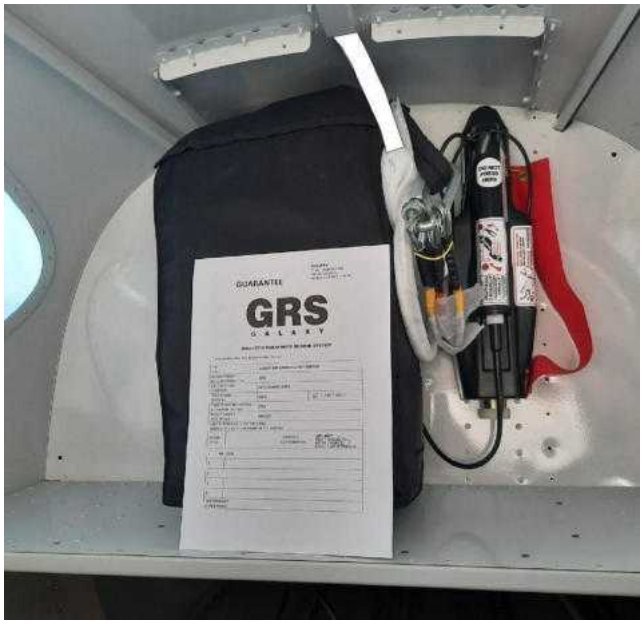
SYSTEM ARRANGEMENT:

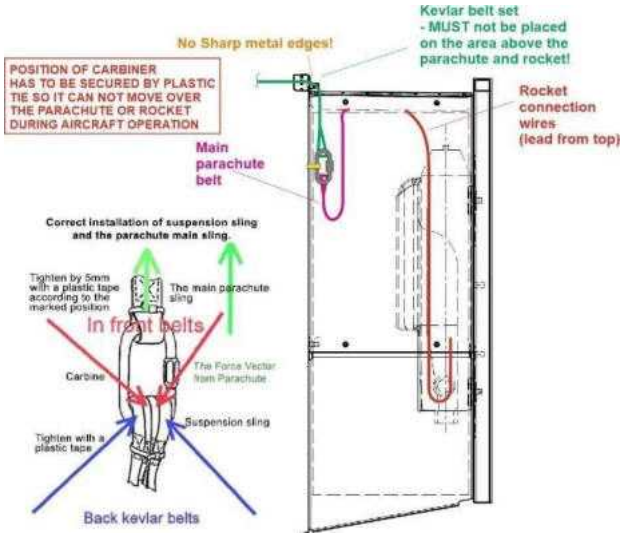


WAY OF GRS ROCKET AND SOFTPACK INSTALLATION:

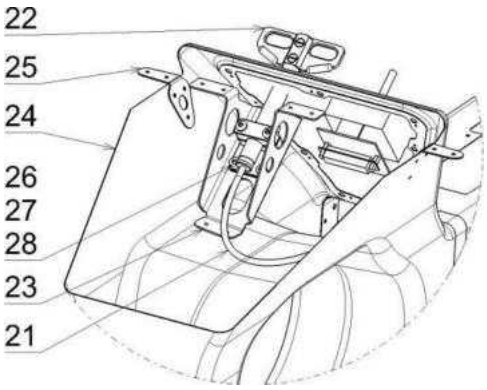




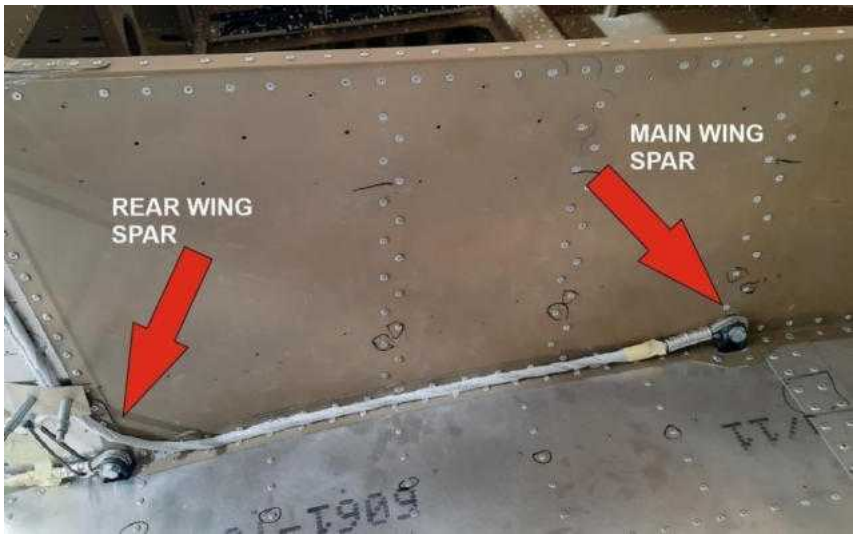




ACTIVATION HANDLE POSITION: on the center of instrument panel



HANG SYSTEM: Kevlar belt 50 kN are used as a front one hang belts, 25 kN for rear. As hang points were selected main and rear wing spar. Kevlars are secured in its position by plastic ties and silicone glue so it cannot move over the parachute unit during aircraft operation. Outside parts are fully covered by metal sheet covers. Descending angle is set to 16°.



DESIGNED DESCENDING POSITION