PILOT'S OPERATING HANDBOOK

and

FLIGHT MANUAL

FLYITALIA

MD3 RIDER

BE CAREFULL !

Followed text of flight manual is only informative - prepared as the background for whole world, adapted according to notices from Czech LAA certification process and dealers wishes …
It is not possible to use that without approving of domestic dealers or certification offices in specific country verification.

(there is needed to be adapted mainly according to regional limits and UL requirements directions)

Aircraft Type: **MD-3 Rider**
/ version

Serial number:

Registration:

Date of issue:

LAA Approval number and date:

ULL - 02 / 2006

31.5. 2006

LTF Approval number and date:

Manufacturer – stamp and signature:

The airplane must be operated by the information and limitations which are presented in this handbook.

This handbook must be available to pilot any time during the flight.

LIST OF THE REVISIONS AND THE REPAIRS

11.4. 2006

Ordinal No.	Number of document - bulletin	It concerns to pages No.	Date of issue	Signature

1. GENERAL

1.1. Introduction

This handbook is provided with your aircraft to allow you to attain as much knowledge about the aircraft and its operation as possible. Read this manual before your first flight and make sure you understand all the information contained here.

1.2. Certification bases

This aircraft was manufactured in accordance ultralight airworthiness standards and does not conform to standard category airworthiness requirements.

The following standards were used:

UL-2 – Czech Republic
LTF-UL - Germany

1.3. Warnings, cautions and notes

The following definitions apply to warning, cautions and notes used in this manual:

WARNING: Information which could prevent personnel injury or loss of life

CAUTION: Information which could prevent damage to equipment

NOTE: Information of special importance to pilot

1.4. Aircraft basic description

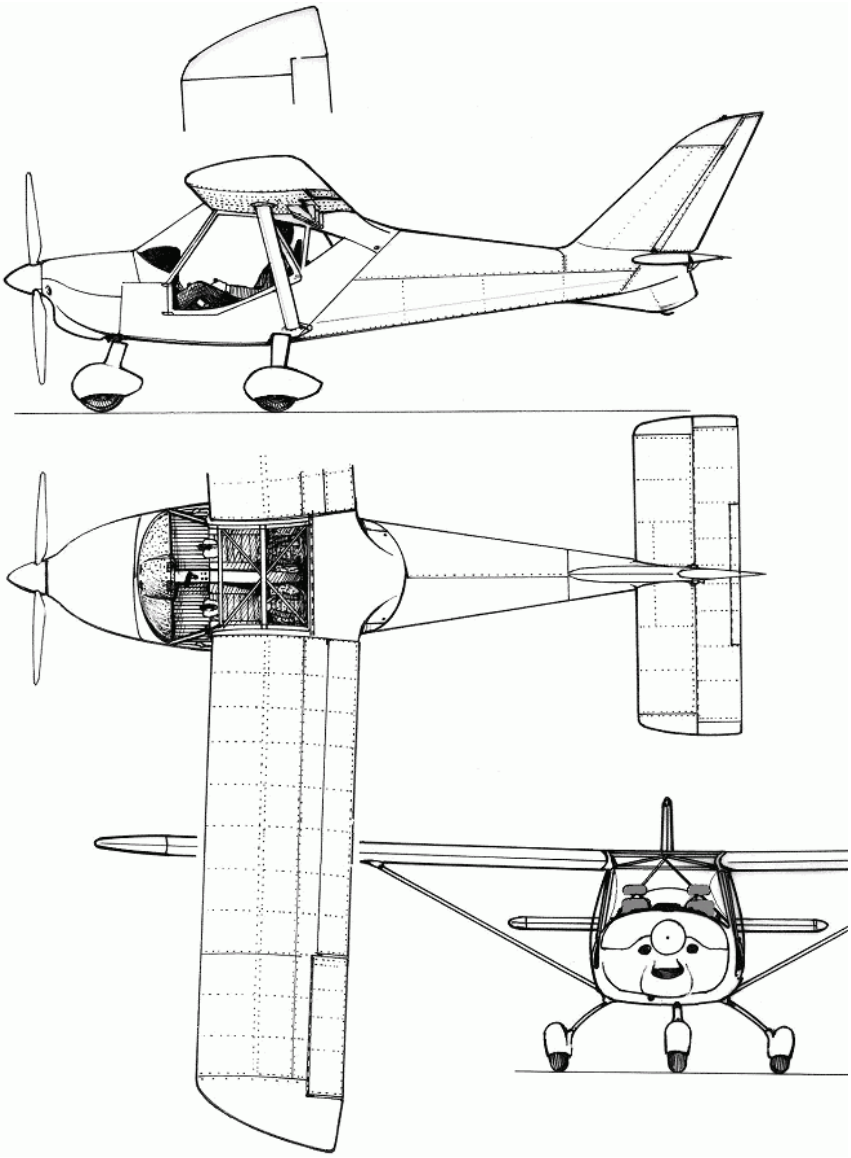
MD-3 Rider is an all metal design, light high-wing ultralight airplane with glued and riveted aluminum alloy airframe, welded cockpit cage and aerodynamic shaped composite fuselage canopy and fairings.
The aircraft is equipped with 100HP Rotax 912 ULS engine (80HP Rotax 912 UL as an option for **MD-3 UL** model) and Woodcomp SR 200 B 3-blade on ground adjustable propeller (other propeller are optional – see Supplement 2)

Wing span	**9,0 m**
Length	**5,9 m**
Height	**2,3 m**
Wing area	**9,9 m^2**
MAC length	**1,15 m**
Forward swept wing	**3°**

Existing aircraft versions, approved by calculations and proofs coveres installations of engines Rotax 912ULS (standard), Rotax 912 UL, Rotax 914, using of folded wings (FW), and has a lot of option *(for exmple standard UL version has light struts from aluminum alloy tubes, hand operated flaps , not reinforced rear fuselage part without tailbump and aerodynamic areas in Alclad)*
Version **SportRider** is not covered by this manual because of all another limits in LSA requirements!

Marking of specific aircraft version is shown in titul page 2 and its extract definition is here :

1.5. Three-view drawing



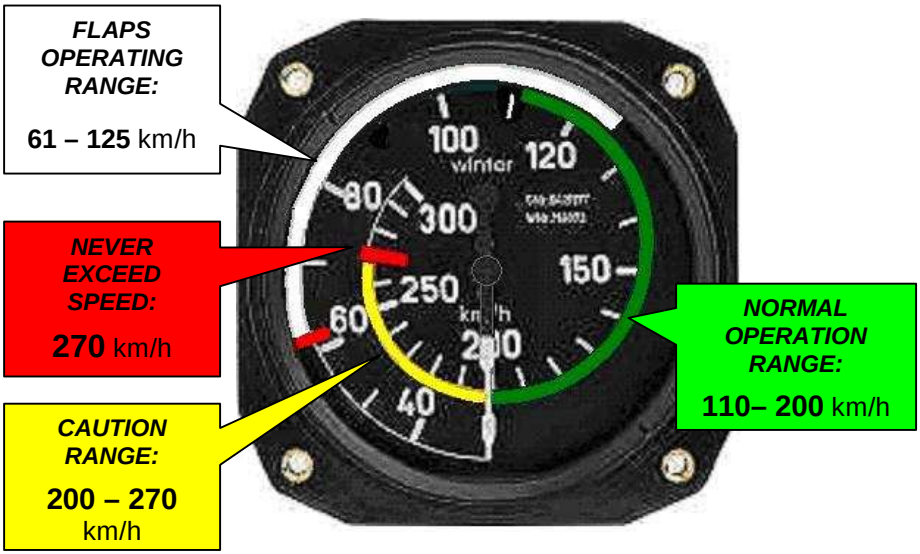
2. LIMITATION

2.1. AIRSPEED LIMITATION

Speed		IAS km/h
V_{NE}	Never exceed speed	**270**
V_{RA}	Maximal speed in hard turbulence	**200**
V_A	Maneuvering speed	**165**
V_{FE}	Maximum flap extended speed	**125**

WARNING: Above Maneuvering speed use smaller deflection of control surfaces only - the aircraft may be overloaded !

2.2. AIRSPEED INDICATOR MARKINGS



2.3. Engine

The **MD-3 Rider** is powered by ROTAX 912ULS engine, **MD-3 UL** model is powered by Rotax 912 UL.

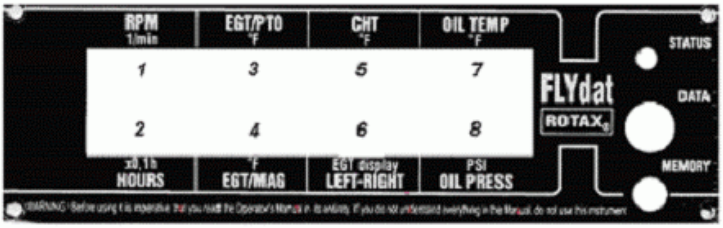
Aircraft Engine model	**MD-3 UL Rotax 912 UL**	**MD-3 ROTAX 912 ULS**
Max. power- take-off (kW)	59,6	73,5
- continuous (kW)	58	69
Max. engine speed (5 min)	5 800 RPM	
Max. engine speed (continuous)	5 500 RPM	
Max. cylinder head temperature (℃)	115	115
Max. oil temperature (℃)	140	130
Oil pressure minimum (bar)	0,8 below 3500 RPM, 2,0 above 3500 RPM	
Oil pressure maximum (cold start only, bar)	7	
Oil pressure normal operation (bar)	2,0 – 5,0	
Fuel pressure (min-max, bar)	0,15 – 0,4	
Operation outside temperature range	-25℃	
	50℃	

For more details see Operator's Manual for all versions of Rotax 912 supplied with the engine.

WARNING: Flying this aircraft must always be done with the possibility of a safe landing due to loss of engine power. The pilot is fully responsible for consequences of such failure

2.4. Engine instrument marking

The aircraft is equipped with an integrated engine display FLYDAT



Display panel Description Unit Resolution

1	RPM	[1/min]
2	Operation hours	[hours]
3	Exhaust gas temperature	[ºC]
4	Exhaust gas temperature	[ºC]
5	Cylinder head temperature	[ºC]
6	← (→) indicates symbolizes left (right) cylinders,	
7	Oil temperature	[ºC]
8	Oil pressure	[bar]

Indicator Unit Warning limits

	912UL	**912ULS**
Max. RPM	5800	5800
EGT - Exhaust gas temperature (ºC)	860	860
CHT - Cylinder head temperature, (ºC)	115	115
Oil temperature, (ºC)	140	130
Oil pressure, max (bar)	6	6
Oil pressure, min (bar)	0,8	0,8
Oil pressure, normal (bar)	2 – 5	2 – 5

- When a warning limit is exceeded - corresponding value will blink on the Flydat display and also the alarm lamp on the instrument panel blinks.
- When a not-permissible value (alarm limit value) is reached - corresponding value will blink on the Flydat display and also the alarm lamp on the instrument panel blinks – longer intervals.

2.5. Weight limitation

	912 UL	912UL S
Empty weight (standard version, kg)	286	295
Max. take-off weight (NO Ballistic Recovery System installed, kg)	450	450
Max. take-off weight (Ballistic Recovery System installed, kg)	472,5	472,5
Max. crew weight - *calculated for* (kg)	200	200
Min. crew weight (kg)	55	55
Max. weight in the baggage compartment (kg)	15	15

MAXIMAL CREW WEIGHT (kg) depend on fuel and baggage quantity						
Fuel tank filling →	**Fuel gauge indication** →	full	3/4	1/2	1/4	30 min of flight
	Fuel quantity in liters →	92	69	46	23	5
Baggage weight →	Max: 15 kg					
	½ : 7,5 kg					
	Without baggage					

WARNING: Do not exceed these weight limits. Pay attention to fuel quantity especially when 2 persons are on board – DO NOT EXCEED maximum take-off weight

2.6. Center of gravity

Front center of gravity limit	19 % MAC
Rear center of gravity limit	30 % MAC

See Section 6 for Center of gravity calculation.

2.7. Approved maneuvers

Steep turn (max. bank 60°)
Climbing turn
Lazy eight

Entry speed to these maneuvers – max. 165 km/hod

WARNING: Aerobatics, intentional stalls and spins are prohibited. Maximum angle of bank : 60°

2.8. Maneuvering load factors G

Flap up (0°)	Maximum positive center of gravity load factor	**+ 4**
	Maximum negative center of gravity load factor	**- 2**
Flaps down	Maximum positive center of gravity load factor	**+ 2**
	Maximum negative center of gravity load factor	**0**

2.9. Flight crew

Minimum crew	1 pilot
Maximum number of persons on board	2 persons

2.10. Kind of operation

WARNING: Only VFR day flights are permitted.

WARNING: IFR flights and flying in clouds is prohibited. Flight into know icing is prohibited

2.11. Fuel

2.11.1. Approved fuel types

Premium unleaded auto fuel (**Natural 95** in Czech - Standard Spec. for Automotive Spark-Ignition Engine Fuel, ASTM D 4814) or AVGAS 100 LL.

Note: Due to the higher lead content in AVGAS, the wear of the valve seats, the deposits 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 other fuel types are not available.

For more details see Operator's Manual for all versions of Rotax 912 supplied with the engine.

2.11.2. Fuel capacity

Fuel tank capacity (each wing tank)	**46** liters
Total fuel capacity	**92** liters
Unusable fuel	1 liter

2.12. Other limitation

WARNING: No smoking

Max. crosswind component	**10 knots** (5 m/s)
Max. wind in runway direction	**24 knots** (12 m/s)

Maximum outside temperature	50 ℃
Minimum outside temperature	- 25 ℃

Heavy rain or extensive moisture can cause mild decrease airplane performance. During the flight with expressive moisture we still recommend to increase the take-off and landing speed approximately about 10 km/hour

2.13. PLACARDS

Registration label	
Matriculation:	
Producer:	**GRYF Aircraft** spol. s r.o.
Type/Name :	**MD3 Rider**
Production number/year:	
Empty weight:	**kg**
Max. take-off weight:	**kg**

Basic international placards :

This ultra-light aircraft has been approved only for VFR day flights under no icing conditions.

AEROBATICS maneuvers and intentional spins are PROHIBITED !

AIRSPEED IAS		
Never exceed	270	km/hour
Maneuvering	165	km/hour
Stalling	82	km/hour
Stalling with flaps	61	km/hour

Examples of next specific placards :

ENGINE SPEED

Max. Take-off (max 5min)	**5 800** rpm
Max. continuous	**5 500** rpm
Idling	**1 400** rpm

46 litre
unleaded fuel
min. MON 85 RON 95

Baggage
max.
15 kg

tyre 180 +20 kPa

Next used placards are classical for all aircraft – open/close, instrument description etc.

As example of specific regional placards, followed there are shown translated LAA CZ placards :

OPERATION INFORMATION AND LIMITS			
Matriculation :			
Empty weight :			kg
Max. take-off weight :			kg
Max. payload :			kg
Max. baggage weight:		**15**	kg
Min. pilot weight:		**55**	kg
Max. permissible speed	V_{NE} :	**270**	km/hod
Stall speed in landing configuration	V_{SO} :	**61**	km/hod
Max. permissible speed with flaps	V_{FE} :	**125**	km/hod

MAXIMAL CREW WEIGHT (kg) depend on fuel and baggage quantity						
Fuel tank filling →	**Fuel gauge indication** →	full	3/4	1/2	1/4	30 min of flight
	Fuel quantity in liters →	92	69	46	23	5
Baggage weight →	Max: 15 kg					
	½ : 7,5 kg					
	Without baggage					

This product is not liable to approving of Civil Aircraft Administration and is used in own risk of user.
Intended spins, stalls and aerobatics are prohibited.

3. EMERGENCY PROCEDURES

This section provides checklist and amplified procedures for coping with emergencies that may occur. Emergencies caused by airplane or engine malfunction are extremely rare if proper pre-flight inspections and maintenance are practiced. However, should an emergency arise, the basic guidelines described in this section should be considered and applied as necessary to correct the problem. All air speed values in this chapter are presented in km/hod Indicated Airspeed unless indicated otherwise.

3.1. Engine failure and emergency landings

3.1.1. Engine failure during take-off run

- throttle	reduce to idle
- ignition	off
- master switch	off
- brakes	as required

3.1.2. Engine failure during take-off

- airspeed	- **125** km/hod
- choose a landing site	- below 150 ft - land ahead, if possible
	- above 150 ft - choose suitable landing site

The landing site is to be preferably chosen in the runway direction or the nearest suitable site clear of obstacles

- master switch	off
- ignition	off
- fuel tank valves	shut
- flaps	extend as needed
- safety belts	tighten

after touchdown:

- brakes	as required

3.1.3. In-flight engine failure

- airspeed	**125** km/hod
- trim	trim
- landing site selection	select

check situation (actual flight level etc.) and continue according to procedure 3.2. (in-flight engine starting) or procedure 3.1.2 - if the engine cannot be started up

3.1.4. Carburator icing

- airspeed	**140** km/hod) min.115,
- throttle	try to find RPM with smallest lose of power

- leave the icing area (if possible)
- increase slowly the engine power to cruise after 1-2 minutes
- when engine power is not recovered, land on the nearest airfield or off-airfield - following the procedure described in 3.1.2

3.2. In-flight engine starting

- airspeed	**130** km/hod
- master switch	on
- fuel tank valves	open to tank with more fuel
- choke	activate (cold engine only)
- throttle	idle (when choke is activated), 1/3 of travel otherwise.
- ignition	on
- starter	start up

- if the engine cannot be started up (not enough power from battery), increase the airspeed to 150-170 km/hod to rotate the propeller to support the engine starting

WARNING: Loss of height needed for in-flight engine starting is approximately 600 ft.

3.3. FIRES

3.3.1. Engine fire on the ground

- fuel tank valves — shut
- throttle — full
- ignition — off
- master switch — off
- abandon the aircraft and extinguish fire (if possible)
- fire damage — inspect

WARNING: DO NOT CONDUCT ANOTHER FLIGHT BEFORE THE FIRE CAUSE HAS BEEN DETERMINED AND REPAIRED

3.3.2. Engine fire during takeoff

- throttle — idle
- fuel tank valves — shut
- IF already airborne — keep airspeed of **115** km/hod and land
- brakes — as required to stop the aircarft

after the aircraft come to stop:

- throttle — full
- ignition — off
- abandon the aircraft and extinguish fire (if possible) once is stopped

3.3.3. Engine fire in flight

- fuel tank valves — shut
- throttle — full
- airspeed — increase – try to „cut-off“ flames. Do not exceed $\mathbf{V_{NE}}$
- landing site selection — the nearest airfield, or a suitable landing site for emergency landing
- ignition — off
- master switch — off
- airspeed — **125** km/hod
- wings flaps — extend as needed
- safety belts — tighten
- perform emergency landing
- abandon the aircraft and extinguish fire (if possible)

WARNING: DO NOT ATTEMPT TO RESTART THE ENGINE

WARNING: DO NOT CONDUCT ANOTHER FLIGHT BEFORE THE FIRE CAUSE HAS BEEN DETERMINED AND REPAIRED

3.3.4. Cockpit or electrical fire

- cockpit door	open to remove smoke from the cockpit
- radio, gps or other switches	off

Land as soon as possible. Extinguish fire as soon as possible.

3.4. Gliding

optimum gliding speed	**125** km/hod
Gliding ratio (at 110 km/hod)	**1:10**

3.5. Precautionary Landing

- choose suitable landing site, evaluate wind (direction and speed), surface, slope and obstacles
- perform a fly-over at a speed of 120 km/hod above the selected landing site at suitable height (150 ft suggested), observe the landing site
- Follow normal landings checklist and land,

after touchdown perform the following:

- ignition	off
- master switch	off
- fuel tank valves	shut
- brakes	as required

3.6. Blown-Out Tire Landing

Use normal approach and landing procedure, keep the damaged wheel above ground during the flare as long as possible using ailerons (or elevator for the nose wheel).

3.7. Damaged Landing Gear Landing

Use normal approach and landing procedure, keep the damaged wheel above ground during the flare as long as possible using ailerons (or elevator for the nose wheel).

3.8. Vibrations or other engine problem

Vibrations:

- set engine speed to such power setting where the vibrations are minimum
- land as soon as possible, consider off-airfield landing, especially when vibrations are increasing

Oil pressure drop – an engine failure is probable in this case:
Reduce the engine power and land as soon as possible (before an failure occurs), consider off-airfield landing.

3.9. Inadvertent icing encounter

- throttle	increase above normal cruise settings
- course	reverse or alter as required to avoid icing
- altitude	climb (if possible)

3.10. Extreme turbulence encounter

- Airspeed	reduce to **160** km/hod
- safety belts	tighten
- loose objects	secure

3.11. Electrical system malfunctions

Charging indicator illuminated: - switch all instruments not necessary for the flight as all are only battery powered in this case.

3.12. Inadvertent Stall and spin recovery

Stall or spin should not occur during normal aircraft operation and **are prohibited**.

3.12.1. Stall recovery:

-lower the nose by pushing the control stick
-gradually increase power

Loss of flight level in straight direction after stall is
150 - 200 ft = **45 - 60** m.

3.12.2. Spin recovery

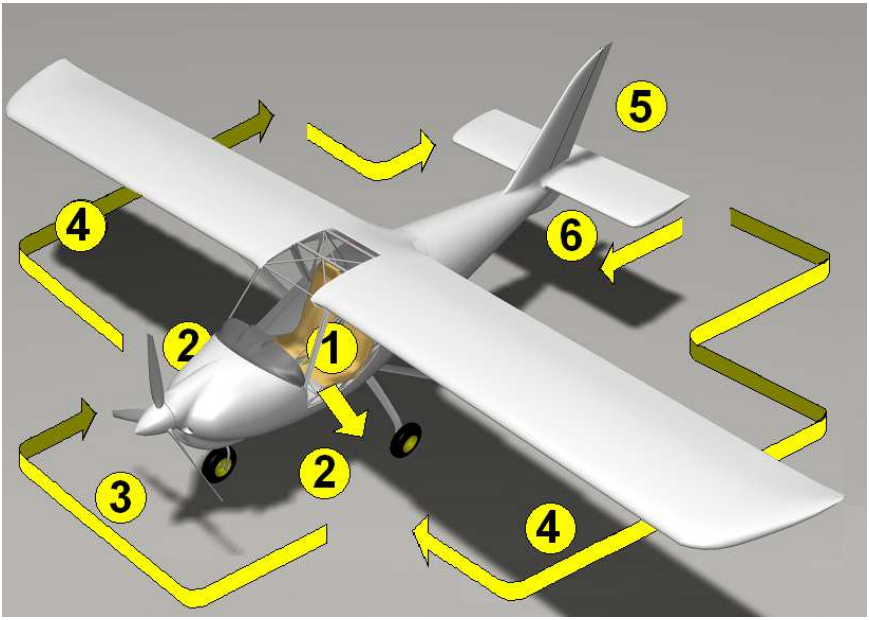
WARNING: Spin characteristics of this airplane have not been tested. A procedure bellow is for information only

- throttle	idle
- aileron	neutral
- rudder	opposite to rotation
- control stick	fully pushed

Once the rotation is stopped, central rudder and establish a level flight.

4. NORMAL PROCEDURES

4.1. PRE-FLIGHT INSPECTION



4.1.1. COCKPIT

- Master switch and ignition - off
- Attachment and position of seats - check
- Safety belts - inspect
- Instruments and equipment - inspect
- Control stick - inspect, freedom of movement
- Rudder pedals - inspect, freedom of movement *(consider nose wheel control)*
- rudder and aileron cable control systems circles - inspect
- Engine control - inspect, freedom of movement
- Brakes - function
- Condition of the composite shell and transparent canopy

4.1.2. LANDING GEAR

- Landing gear and brake system	- inspect
- Landing gear leg and attachment	- inspect
- Rubber shock absorber of the nose landing gear	- inspect
- Tire pressure	- check

4.1.3. POWER PLANT

- Engine, propeller general condition	- inspect
- Safety pins and wires	- inspect
- Engine mount and engine bed	- inspect
- Exhaust silencer	- inspect
- Ignition system	- inspect
- Fuel system - hoses and pump	- inspect, drain the system
- oil quantity	- between MIN and MAX marks

4.1.4. WING

- Wing	- inspect surface and damages
- Struts, hinges, saving	- inspect
- Ailerons	- inspect, freedom of movement and deflections
- Flaps	- inspect
- Fuel tank tightness and cups	- inspect

4.1.5. CONTROL CABLES

- Rudder control cables	- inspect condition and tension
- Turnbuckles, bowdens, saving	- inspect

4.1.6. TAIL UNIT and FUSELAGE

- Tail unit surface and damages	- inspect
- Control surfaces	- freedom of movement, deflections
- Trim tab	- inspect
- Tail skid	- inspect
- Fuselage	- inspect surface and damages

4.2. ENGINE STARTING

- pre-flight inspection	completed
- safety belts	adjust and secure
- instruments	check of values, settings
- door	closed, locked
- master switch	switch on
- fuel tank valve (right / full tank)	open
- choke	activate (cold engine only)
- throttle	1/3 of travel (idle for cold engine)
- control stick	pulled
- brakes	on
- propeller area	"clear"
- ignition	switch on
- starter	switch on (10 sec as maximum without interruption, followed by a cooling period of 2 minutes)
- after starting the engine,	adjust speed to smooth operation – idle
- instruments	check of indication (oil pressure must rise within 10 seconds.
- choke	switch off slowly (cold engine only)
- avionics and other switches	switch on as required

4.2.1. Engine warm-up and test

Warm up to operating temperature - first at idle or **2000** RPM for 2 minutes, then at **2500** RPM to reach oil temperature of **50** ℃. Check temperature and pressure values must be within operating limits all the times

- Check the maximum power
  RPM must be around 5000 RPM
  - depending on propeller settings.
- Check of ignition (magnetos) – set **3 850** RPM,
  RPM drop should not exceed 300 on either magneto nor 120 differential between magnetos.
- Check idle - **1600** RPM +-100

CAUTION: Perform the engine check heading upwind. Do not carry it out on loose terrain. Consider also safety of other person. Do not operate the engine for longer period of time than necessary and allow sufficient cooling before switching off

4.3. Taxiing

The maximum taxiing speed is 10 km/hod – walking speed. Always check brakes functionality as soon as the aircraft start taxiing.

4.4. Normal takeoff

- brakes	according to need
- trim	neutral
- wing flaps	take-off position
- master switch	on
- ignition	on
- fuel indicattors	quantity check
- fuel tank valves	chose tank with more fuel (select right tank when both tanks are full)
- instruments	check
- door	closed, locked
- safety belts	fastened, tightened
- controls	freedom of movement
- runway and take-off area	check of availability
- radio	report

Increase the throttle to **full**.
Unstick the aircraft at speed around **70** to **80** km/hod by pulling the control stick slightly and accelerate.
Do not climb until speed of **115** km/hod is reached.

WARNING: Do not take-off when engine is not running smooth or runway is occupied

- initial climb speed	**115** km/hod
- engine speed	reduce to max 5 500 RPM
- engine instruments	check
- wing flaps	flaps up **above 150 ft**,or **125 km/hour**
- trim	trim

4.5. Climb

- throttle	5,500 RPM max
- airspeed	**120 to 140 km/hod** as required

4.6. Cruise

- bring the aircraft into horizontal flight

- speed	**4,000 – 5,500** RPM (as required)
- airspeed	as required
- engine instruments	check
- fuel tank valves	switch between tanks when necessary

WARNING: Do not forget to change the wing tank supplying the engine on regular basis to prevent fuel starvation. When both fuel tanks are full or close to full, select right tank. Do not have both tanks open at the same time.

4.7. Approach

4.7.1. Descent

- throttle	as required
- engine instruments	check

WARNING: Avoid prolonged operation with IDLE during the flight as the engine might became overcooled and loss of power might occur

4.8. Downwind

- power	4,000 – 5,000 rpm
- airspeed	**120-140** km/hod
- engine instruments	check
- fuel tank valves	open to tank with more fuel
-safety belts	tighten
- approach area and landing site	situation

4.9. Normal landing

4.9.1. On Base Leg

- power	3,000 rpm, or according to need
- airspeed	**125** km/hod
- engine instruments	check
- wing flaps	take-off position *(position **I**)*
- trim	trim
- final leg airspace	situation

4.9.2. On Final

- airspeed	**110 - 115** km/hod
- power	adjust as needed
- engine instruments	check
- wing flaps	landing position *(position II or III according to need)*
- trim	trim
- check of landing site	situation

4.9.3. Landing

At a height of about 30 ft reduce the engine speed to idle. Maintain speed of 115 km/hod till the flare. When flaring at a height of 1 to 2 ft above ground, decelerate gradually by pulling the control stick backward till the aircraft touches-down.
Save immediately hit of front undercarriage by continuing of slowly control stick pulling.

4.9.4. After landing

- brakes	apply when necessary
- wing flaps	retract

4.9.5. Engine stopping

- power	cool down the engine at 2,000 rpm when necessary
- avionics and other switches	off
- ignition	off
- master switch	off
- fuel tank valves	shut
- secure the aircraft :	brake aircraft by using of brake lever parking position, chocks or other way to prevent the aircraft from movement, lock the controls (using safety belts)

4.9.6. Post-Flight Check

Check the overall condition of the aircraft.

4.10. Short field takeoff and landing procedures

Normal procedures are to be followed, use second landing flaps setting together with approach speed **100 - 110** km/hod for short field landing.

4.11. Balked landing procedures

- power	max. 5,500 r.p.m
- airspeed	**125** km/hod
- engine instruments	check
- wing flaps	take-off
- trim	trim
- wing flaps	retract at a height of 150 ft
- trimming	trim
- power	max. 5500 rpm
- climb	**125** km/hod

4.12. FUEL SYSTEM using

MD3 Rider fuel system consist from two integral fuel tanks. Fuel is going from left and right fuel tank to two fuel vents, so pilot needs to checks fuel level and switch one or other vent.

According to direction of Rotax producer for 100HP engine Rotax 912ULS, fuel system has return branch back to RIGHT fuel tank.

Flight with both vents opened is not permitted and DANGEROUS if fuel level in one of fuel tank is smaller !!!

NORMAL USING of FUEL SYSTEM :

1) To **START FROM RIGHT FUEL TANK**

2) after right tank is empty, to switch to left tank and close right tank vent.
*To make better roll balancing, You can diversify both tanks using. Take in mind, if You are flying alone, You are roughly balanced with **FULL** opposite fuel tank!*

3) Fuel return system will still return some fuel to right fuel tank (according to engine regime), so pilot needs to check it continuously - and switch it back to right tank after left tank is near empty.

Do not use start from left fuel tank, when right fuel tanks is full !!! Fuel is going then from left to FULL right fuel tank - and through air vent out of the tank.

5. PERFORMANCE

These flight performance are valid for the standard version of airplane under maximum take-off weight 450 kg under normal flying technique and ISA conditions (seal level, 15℃, 1013 hPa). Ac tual performance might be different due to pilot skill, weather and aircraft condition

WARNING: Variations in pilot technique as well as condition and settings of the aircraft (e.g. propeller pitch) can cause significant differences in flight performances

5.1. Airspeed indicator system calibration

IAS km/hod	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**120**	**130**	**140**	**150**	**160**
CAS km/hod	**53**	**62**	**71**	**78**	**86**	**94**	**103**	**112**	**119**	**127**	**136**	**144**

IAS km/hod	***170***	***180***	***190***	***200***	***210***	***220***	***230***	***240***	***250***	***260***	***270***
CAS km/hod	***153***	***162***	***172***	***181***	***190***	***200***	***209***	***218***	***227***	***236***	***245***

IAS – indicated speed of flight, *indication of* airspeed indicator *in Your aircraft*
CAS – calibrated speed, *real speed of flight (in zero flight level ISA) = repaired by indicator and aerodynamic error*

5.2. Stall speed

Stall speed valid for aircraft weight 450 kg and wing level flight

	indicated	**Stall speed** (km/hod IAS)
Flaps up		**79**
Flap take-off position	I	**68**
Flaps - landing position 1	II	**61**
Flaps - landing position 2	III	**61**

5.3. *Take-off distance* *(1. flaps position - 15 °)*

Grass surface:

	Take-off run	**Total take-off distance** to 50 ft
MD-3 UL	**130** m	**292** m
MD-3	**120** m	**270** m

Paved surface:

	Take-off run	**Total take-off distance** to 50 ft
MD-3 UL	**120** m	**277** m
MD-3	**110** m	**250** m

5.4. *Landing distance*

Grass surface:

	Total landing distance from 50 ft	**Landing ground roll**
MD-3 UL	**386** m	**108** m
MD-3	**390** m	**108** m

Paved surface:

	Total landing distance from 50 ft	**Landing ground roll**
MD-3 UL	**363** m	**91** m
MD-3	**366** m	**91** m

5.5. *Rate of climb*

Altitude	**MD-3 UL**	**MD-3**	**Airspeed** to achieve max. rate of climb (km/hod IAS)
0 ft	**4,05** m/s	**5,2** m/s	135
		1020 ft/min	
3000 ft	**3,12** m/s	**4,3** m/s	135
		850 ft/min	

5.6. Cruise, endurance, range

MD3 UL … Rotax 912 UL - 80 HP

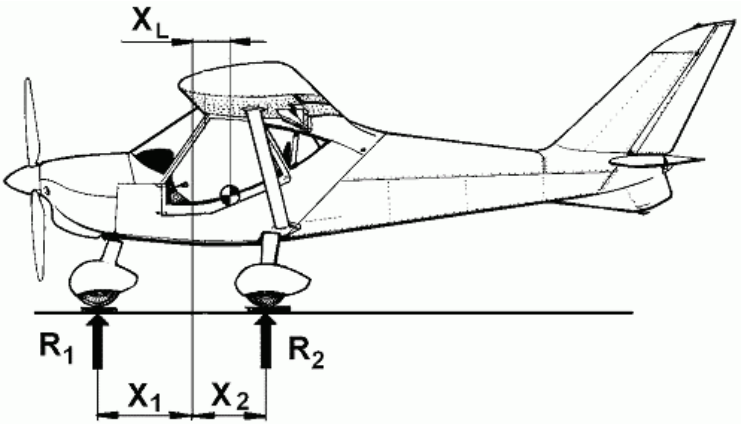
	RPM	4200	4500	4800	5000	5200	5500
IAS	km/hour	**160**	**176**	**191**	**201**	**211**	**227**
CAS	km/hour	**145**	**158**	**171**	**180**	**188**	**202**
Fuel consumptio	liters/ hour	**9,2**	**11,1**	**13,3**	**14,8**	**16,5**	**19,3**
Endurance	hour	**9,8**	**8,1**	**6,8**	**6,1**	**5,4**	**4,7**
Range	km	**1410**	**1280**	**1160**	**1090**	**1030**	**940**

MD3 … Rotax 912 ULS -100HP *(0 m ISA)*

	RPM	4200	4500	4800	5000	5200	5500
IAS	km/hour	**170**	**187**	**203**	**214**	**225**	**242**
CAS	km/hour	**153**	**167**	**181**	**191**	**200**	**215**
Fuel consumptio	liters/ hour	**13,6**	**15,8**	**18,1**	**20**	**22,1**	**25,4**
Endurance	hour	**6,6**	**5,7**	**5,0**	**4,5**	**4,1**	**3,5**
Range	km	**1010**	**950**	**900**	**860**	**810**	**760**

6. WEIGHT AND BALANCE

6.1. Empty aircraft weight and center of gravity determination



The aircraft is wieghted standing on main wheels – all tyres must have the correct size and pressure. The aircraft in this case leveled for the purpose of c.g. determination. The reference plane is leading edge of wing at half of wing span. All operating fluids must be filled to the max volume and also unusable amount of fuel must be in the fuel tanks. The following values has to be measured:

Reaction of the nose wheel	R_1 =	kg
Reaction of left main wheel	R_{2L} =	kg
Reaction of right main wheel	R_{2P} =	kg

Distance of the nose gear from reference plane:

X_1 = mm

Distance of main landing gear from reference plane:

X_2 = mm

Empty weight of the aircraft is calculated as follows:

$$M = R_{2L} + R_{2P} + R_1 [kg]$$

Permitted range for empty weight: **270 – 304 kg**

Note: different weight limit might apply due to national regulation

Center of gravity position of the empty aircraft is calculated as follows:

$$X_L = \frac{X_2 * (R_{2L} + R_{2P}) - X_1 * R_1}{M} [mm]$$

$$\overline{X_T} = \frac{X_L}{1152} * 100 [\%]$$

Permitted center of gravity range for empty aircraft:
20 – 23 %

Weightening must be performed and recorded when any change to the aircraft configuration is made:

Date:	Empty weight M [kg]	Center of gravity		Performed by and date
		X_L [mm]	X_T [%]	

6.2. Weight and center of gravity determination for flight

The correct center of gravity position is ensured when weight of passengers, baggage and fuel is within the approved range (all limits are described in section 2 of this manual)

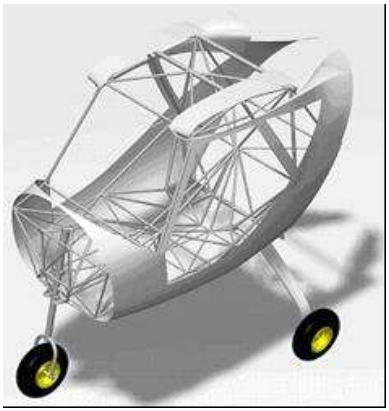
7. AIRCRAFT AND SYSTEM DESCRIPTION

7.1. AIRCRAFT TECHNICAL DESCRIPTION

7.1.1. Airframe

All-metal semi-monocoque airframe, primary glued and riveted from aluminum alloy sheets by blind rivets, enables longer airframe life and simple production, repair and maintenance without great skills.

7.1.2. Fuselage cockpit cage



Fuselage cockpit cage is welded from steel tubes. Its structure cover firewall, engine mounting hinges and front wheel bracket in the front, wing struts and main gear hinges on its sides and instrument panel frame and seats brackets, safety belts, arm-rest and control levers hinges in the middle. On the rear part it has 4 rear fuselage part hinges. On the top welded cage carries wing hinges, prepared for its folding and brackets of aileron and flap controls.

7.1.3. Cockpit Fairing

Cockpit fairing is produced from glass fiber composite, glued on the tubes and sheets of airframe and covers firewall, instrument panel including air vents, windshield frame in the front, conection to the wings in the top and door frames on the sides. In the rear COCKPIT FAIRING is equipped by foldable cargo compartment doors, needed to be folded for wing folding too.

7.1.4. Landing gear

Non-retractable tricycle type :

COMPOSITE main undercarriage LEGS are fixed in two brackets inside of fuselage welded cage by 2+2 bolts.

MAIN WHEELS SAVA **14x4** are equipped by hydraulic disc brakes Aerospool, controlled by handle between pilots.

FRONT LEG is controlled by rudder control pedals and equipped by rubber cable shock absorbing.
Carbon fork carries FRONT WHEEL **13x4**

All landing gear wheels can be optionally equipped by composite wheel fairings .

7.1.5. Side Canopy doors

from carbon fiber with integral 3D shaped plexiglas windows on its full surface enables great view and easy access. Doors are hinged on the front hinges and locked in 2 points on the top and bottom rear corners, equipped by classic outside handles with key locks, and lever handles from the inside in the bottom frame.

7.1.6. Composite engine cowlings

Composite engine cowlings with natural aerodynamic shape are fixed by screws (bottom) and connected by CAM-LOCKs (top part). They have great air intake for water-cooler in the bottom, right-side small air intake for cylinders direct cooling and left side for air box. Oil cooler has independent right side NACA inlet.

7.1.7. Rear fuselage part cone

is riveted from aluminum alloy sheets with integral fin and with horizontal tail hinges on the rear “floor” and rudder hinges on the fin beam. Aluminum alloy cone is finished by composite fairings with aerodynamically smooth transition between horizontal and vertical areas and creates small bottom fin with tail-bump.

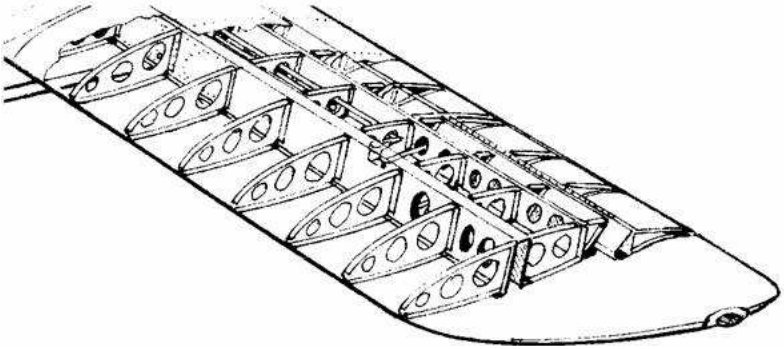
7.1.8. Fin

Fin with symmetrical 12% airfoil NACA 0012 is integral part of Rear fuselage part structure.
Rudder is hinged in two hinges and controlled from bottom - by control cables.

In the top of fin-tip there is located bracket for optional tail strobe light placing.

7.1.9. All metal wings

with simple aerodynamically shaped strut with Ω-beam, pressed ribs and 92 liters (2x46) integral fuel tanks has efficient MS(1)-0313 airfoil. Large aerodynamically shaped wingtips increase wing efficiency. Flaps has aerodynamically smooth shaped gap. Forward 3° wing swept is used to improve aerodynamic shape and free view from cockpit by acceptable center of gravity range.
Wings can be (optionally) folded to the tail for transportation or storage.



7.1.10. Ailerons

40% differential ailerons are hinged on the piano-hinges on the airfoil surface top and driven through control lever riveted to root rib

7.1.11. Flaps

Fowler flaps are hinged on the rear help-beam fixed three levers and controlled through torsion bare in two points both side. BETAKOM system electrically controlled flaps have 15° (take-off), 30°(landing), and 42°(short field landing) deflection.

7.1.12. Horizontal tail

Classic-type all-metal horizontal tail glued by Emfimastic PU50 and riveted by blind rivets from aluminum alloy sheets and pressed ribs and bended beams has symmetrical 12% airfoil NACA 0012.

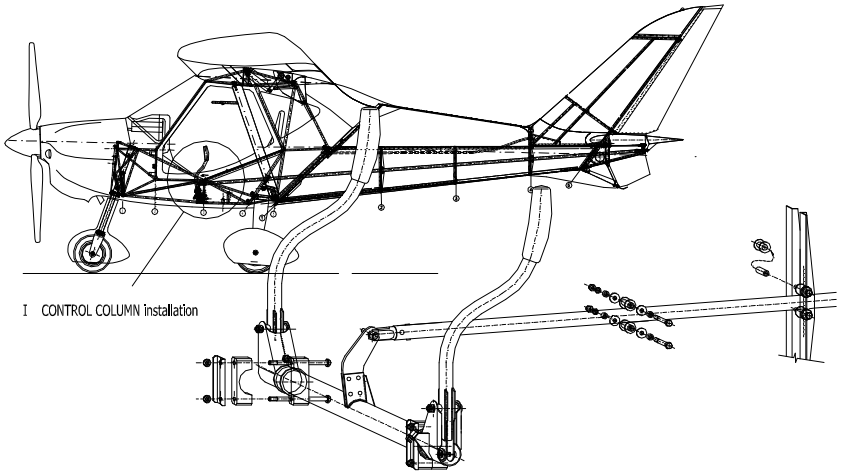
7.1.13. Elevator

The same technology elevator is connected with stabilizer through on the airfoil (rear beam) top fixed piano hinge and has electrically controlled integral TRIM-TAB as a standard.

7.2. CONTROL SYSTEM

Full dual control with classic joysticks between pilot legs and pedals full controllable for both pilots. Flap handle, trim handle, throttle and choke are placed on the central columns.

7.2.1. Elevator control

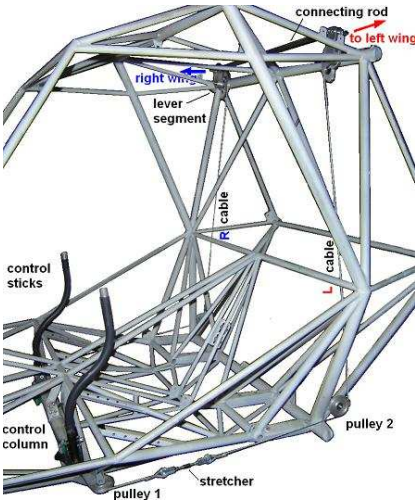


Elevator is controlled by joysticks, fixed in control column through one rod only guided in rod pulleys fixed in metal brackets in welded cage and rear fuselage cone and connected directly with elevator lever.

7.2.2. Ailerons control

Ailerons are controlled by joysticks, fixed in control column through system of cables and pulleys in the fuselage and rods and levers and rod skids (in the wing) fixed in metal brackets.
Cables of aileron control system has to be stretched to roughly 10-12 kg. Bigger stretching creates bigger friction control forces.

If folded wing is used, system is needed to disconnect in lever segments near wing.



7.2.3. Rudder

is controlled by wires in plastic slide tubes and connected through front undercarriage leg control levers. Stretchers are located in the front – accessible from the cockpit

7.2.4. Flaps

are controlled by electric actuator placed in the cockpit ceiling, through torsion tubes with ball/fork connection into wing.

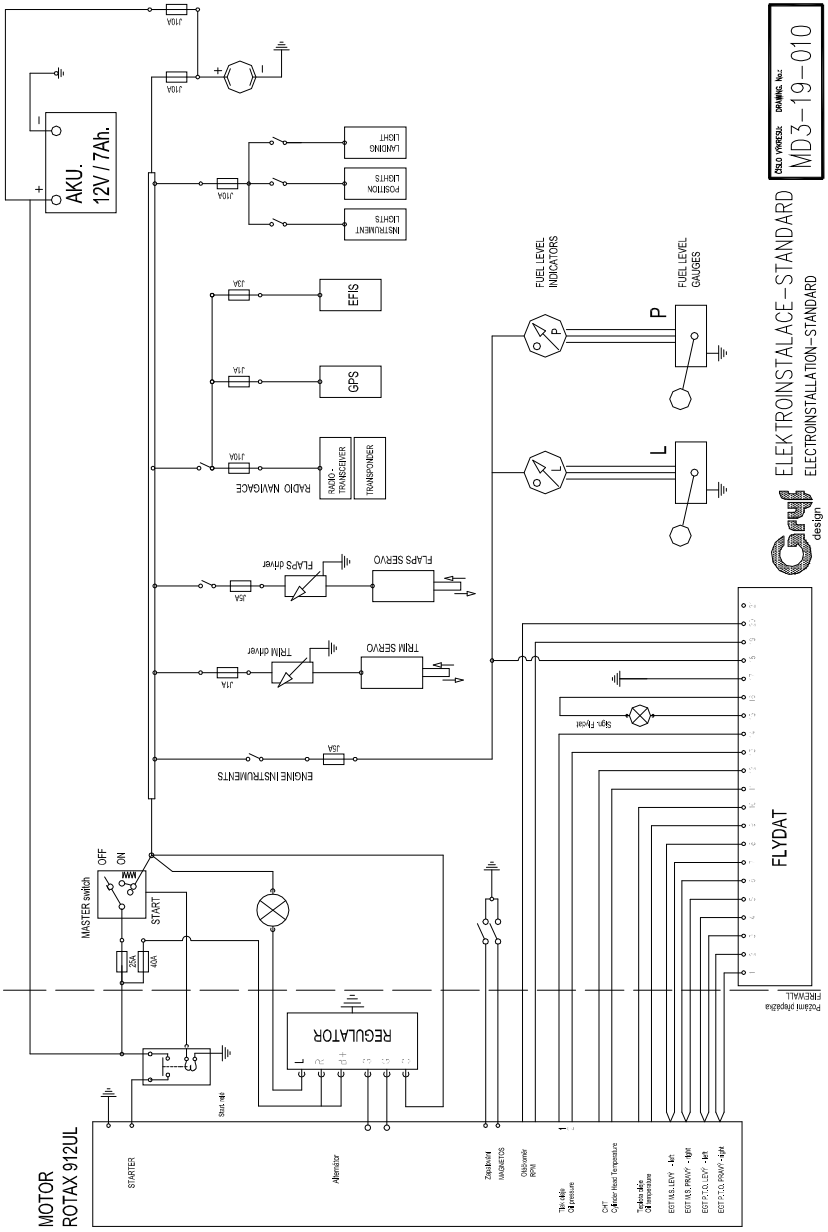
Basic UL version uses ceiling placed hand operated lever

7.2.5. Elevator trim tab

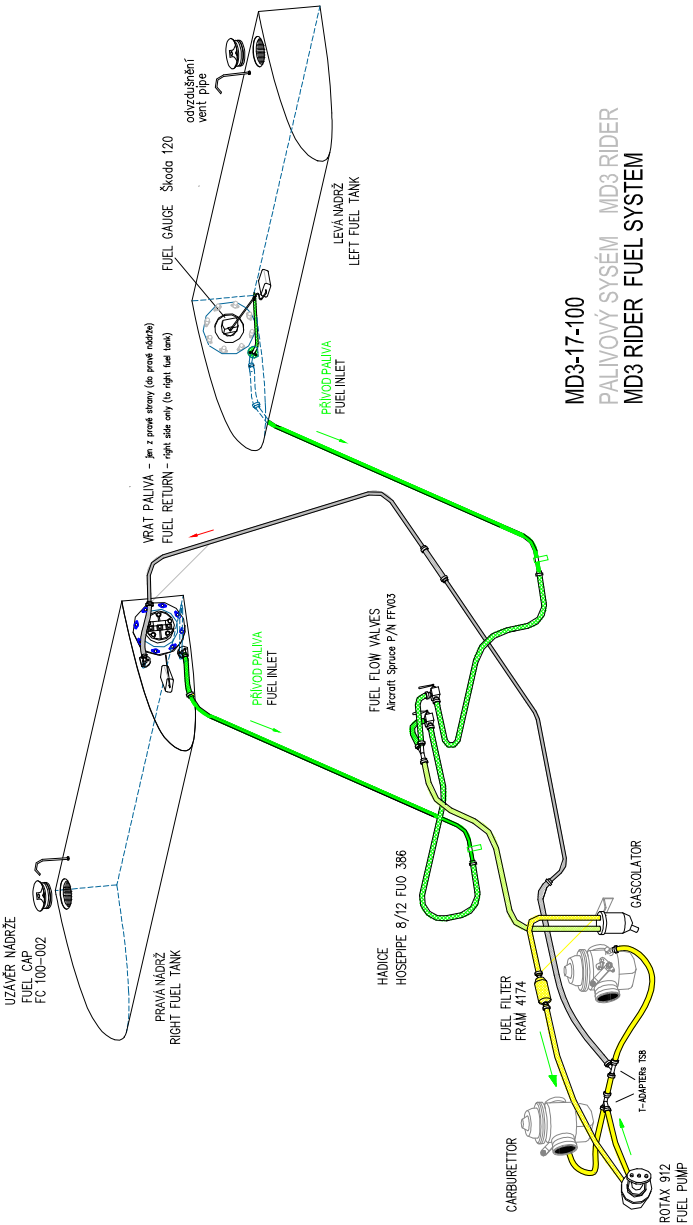
is controlled by electric actuator Aircraft Spruce (MAC/ Ray Allen) placed in the elevator middle, mounted from its top surface .

System uses for installation and drive original bolts, screws and ends, original screw rod is reinforced by disguised and glued tube.

ELECTRIC SYSTEM



7.3. FUEL SYSTEM



7.4. *COCKPIT interior and instrumentation*

ACCOMMODATION

➔ Access to pilot place through forward openable doors (11) closable by levers (12) with possibility to lock it by key from outside

➔ Individual adjustable integral side-by-side composite seats ⑨ for two persons in enclosed cabin – with width in the arms position 1,17m and with pair of four point safety belts ⑩.

➔ Dual controls with dual classic control sticks ⑦, dual rudder control pedals ⑧ , connected with front wheel control – and on central panel ④ located throttle and choke together with handles of flaps and elevator trim, *and with cockpit heating control lever.* For OPTION there are possible to install double rod throttle, or lever throttle and choke unit.

➔ Three-parts instrument panel ① *(instrument panel described in followed chapter)* with alternative compass mounting ② on the top of middle part with air vents ③. Air vents can be for operation in hot condition appended with secondary air vents from appended NACA inlets from sides of cockpit.

➔ Two fuel valve levers ⑥ are mounted on the right desk, right of its gauges and minimum level indicators.

➔Hydraulic brakes of main wheels controlled by one handle ⑤ on the middle column (end of arm rest) between pilots.

➔Rear pilot seats located baggage compartment is accessible from inside or from outside for carrying of larger cargo

7.4.1. INSTRUMENT PANEL

MD-3 Rider instrument panel consists from three parts :
Left side located **flight instruments panel** with starter and magnetos switches.
Right side located **powerplant instruments panel** (engine, fuel, etc) with breakers and switches and
Center located **NAV / COM panel** with fixed position of FLYDAT in its bottom .

Bottom part of Center panel is used for engine controls – **Throttle** and **choke** and heating rod on the left side.

Control drivers of electric flaps and elevator trim – including its indicators are located on middle column between pilots.

If installed, RESCUE SYSTEM has red handler mounted in the ceiling of cockpit.

*Description of instruments defines **standard equipment** and recommended **options**. List of specific aircraft instrumentation is appended as Supplement 3 of this manual.*

FLIGHT INSTRUMENTS are located on the **left side panel** :

Standard : ∅ 3" Airspeed indicator, Altimeter, vertical speed indicator, electric Turn-coordinator
Compass std located on the top of instrument panel

Option : Horizont
Directional Gyro Horizont

ENGINE INSTRUMENTS are located on the **right side panel** :

Standard : 2 Fuel Gauges with minimum level signalization and two fuel shut off valves, Fuel pressure and Manifold pressure gauges, Ampermeter (incl. *shunt),* 12V socket, switches and brakers

Option : **VOX intercom Flightcom 403mc**
VOLTMETER VDO,
Map trap / holder

CENTER PANEL :

Standard : **FLYDAT**

Option : **Radio/Transceiver ICOM A200**
Transponder **Garmin GTX 320A**
GPS Garmin 296 *incl. quick dismountable panel mount*
GPS Bendix King Skymap IIIC *incl. panel mount SM 2204 Quick dismountable* **Rack mount** *SM 2204C for Skymap*
GARMIN GNC 250XL - integrated communication GPS moving map

FLIGHT instruments

standard

BG-3E Altimeter
ø 80mm
under 20 000 ft
air pressure in mbar
3 pointers

standard

LUN1108
Speedmeter
300 km/h
ø80mm,
Mikrotechna

standard

Winter QMII
Slip /bank indicator

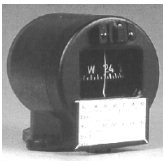
36x60mm (or ø60mm)

option

BC10-1B
vertical speed indicator (Vario)
10m/s ,
ø 80mm

standard

Compass CM-24, on top mounted
ø 60mm (2")



option

BZW-4B
electric Turn-coordinator
(without conector)

Gyro horizon

(ATTITUDE and DIRECTIONAL GYROs)

option

Mikrotechna
LUN 1241
electrical artificial horizon
14 or 28V DC

option

R.C.Allen
RCA15AK-2
electrical
vertical compass
14VDC w/o lights,
ø75mm, 1.035kg

Communication

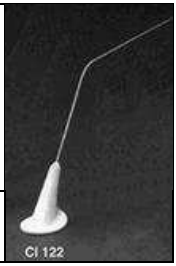
ICOM A200 **transceiver** (radio)

VOX intercom
Flightcom 403mc
with adjustable preference and next audioinputs

Bendix King KY97A **transceiver** (radio) - changeable with ICOM A200, good imunity oposite to interference

VHF antenna CI 122
118-136MHz,
developed specially for "**bottom mounted**" position - perfect communication air-to-ground

Full cable set for assembly



TRANSPONDER
Garmin GTX 320A
(suitable for A200 radiostation)
classical in mode A/C

A-30
altitude encoder

"blind", for C mode

Antenna CI 105
960-1220 MHz,
developed for DME and transponders,
output for BNC connector

GPS

Garmin 296
Color display
resolution 480 × 320 pixel (diagonal 97 mm)
Chargeable battery lithium-ion
Battery capacity on one charge: by full under-light 8 hours of operation, maximal 15 hours
450 g

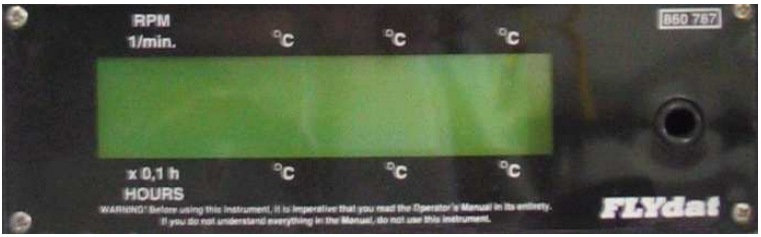
installationable
Bendix/King
Skymap IIIC
(Skyforce) - color GPS with moving map, cost incl. Atlantic datacard, easy control

PANEL MOUNT SM2204
for Bendix/King Skymap
simple to fit, suitable for any flat instrument panel, integral power/SMB connector available as an option - ideal for permanent installation

RACK MOUNT SM2204
for Bendix/King Skymap
to be fitted into a standard radio stack - with the flexibility to remove your unit at will through the "push and release" mechanism

installation **Garmin GNC 250XL**,
integrated communication / GPS, moving map with great resolution, automatical set-up, shown CTR, TMA, RESTR, APT, NDB, Intersection, complet Jeppensen 760 VHF channels . Optimal in connection with GTX 320 transponder)

ROTAX 912 ENGINE INSTRUMENTS - STANDARD set



ROTAX *FLYdat*

ENGINE MONITORING numerical multiinstrument:
RPM 1/min **EGT**/PTO-front °C **CHT** ℃ **oil temperature** ℃
operating **HOURS** **EGT**/PTO-rear°C **EGT** display ↑↓ **oil pressure**–bar

FUEL LEVEL INDICATORs

Škoda 120 (2 pcs.)

VOLTMETER VDO

TEVESO - ROTAX

OPTION :

FUEL PRESSURE INDICATOR
ROTAX

TEVESO - ROTAX 874 230

MANIFOLD PRESSURE GAUGE
(-indicator / boostmeter)

TEVESO – ROTAX

AMPERMETER -30/+30 A

TEVESO - ROTAX

plus **SHUNT** 30 AMPs **WESTACH 237-2A**

- bočník

7.5. POWER UNIT

- **ROTAX 912 S** 100HP engine with electric starter, stainless steel exhauster with integral heating, airbox, and 3-blade on the ground adjustable Woodcomp propeller SR200 and Gryf design spinner with 35mm plug are **STANDARD.**
- 80 HP Rotax 912 optional for *UL version*,
- turbocharged Rotax 914 optional for *Sporty version*

7.5.1. ENGINE

ROTAX® AIRCRAFT engine type 912 ULS (series)
non certified - 100 hp @ 2380 propeller rpm

picture shows **912 ULS 3 -DCDI**
with options, alternator and airbox

DESCRIPTION:

4-cylinders
4-stroke
liquid/air cooled engine
with opposed cylinders

dry sump forced lubrication with separate 3 l (0.8 gal US) oil tank

automatic adjustment
by hydraulic valve tappet

2 CD carburetors

mechanical diaphragm pump

electronic dual ignition

electric starter

integrated reduction gear
i = 2,273
(option i=2,43)

⚠ WARNING:

This aircraft engine does not comply with federal safety regulations for standard aircraft.

This engine is for use in experimental and ultralight uncertified aircraft only and only in circumstances in which an engine failure will not compromise safety.

TECHNICAL DATA:

performance for standard conditions (ISA)

ENGINE Type: 912 ULS D.C.D.I.

performance	**69,0 kW (95,0 hp) @ 5500 1/min(rpm)**
Max. 5 min.:	**73,5* kW (100,0* hp) @ 5800 /min(rpm)**
torque	128 Nm (94,0 ft.lbf.) @ 5100 1/min (rpm)
Max. RPM:	5800 1/min (rpm)
Bore:	84,0 mm (3,31 in.)
stroke:	61 mm (2,40 in.)
displacement:	1352,0 cm3 (82,6 cu.in.)
compression ratio:	10,5:1
ignition unit:	DUCATI double CDI
ignition timing:	4° up to 1000 1/min (rpm) / ab ove 26°
spark plugs:	ROTAX part no. 297 940
generator performance:	250 W DC @ 5500 1/min
voltage:	13,5 V

OPERATING MEDIA:

Fuel:	**min. RON 95***- min. AKI 91* or AVGAS 100 LL
Oil:	API SF or SG
cooling liquid:	**50% BASF Glysantin-Antikorrosion / 50% water**

WEIGHTs:

Standard engine with gearbox i=2,43:	**56,6 kg (124,8 lb.)**
oil radiator 886 029:	0,5 kg (1,1 lb.)
radiator 995 697:	1,0 kg (2,2 lb.)
slipping clutch:	1,0 kg (2,2 lb.)
air guide hood:	0,8 kg (1,8 lb.)
vacuum pump:	0,8 kg (1,8 lb.)
external alternator 40 A/ 12 V DC:	3,0 kg (6,6 lb.)
fuel pump with installed fuel lines:	0,2 kg (0,4 lb.)

7.6. PROPELLER

MD3 Rider is standard equipped with 3-blade on the ground adjustable propeller Woodcomp SR200 and own design spinner with 35mm plug

ON GROUND ADJUSTABLE PROPELLER - TYPE SR 200	
PROPELLER DIAMETER	1680 mm
APPLICATION :	FOR MAX. 100HP ENGINE

PROPELLER BLADES - CONSTRUCTIONAL DESIGN:

1. WOOD-CARBON (BLACK) BLADES WITH PLASTIC LEADING EDGE.

For propeller blades with wooden core and carbon fibre surface, the leading edges of the blades are cast from highly resistant plastic material, that serves as protection against impacting sand, small stones, water and other effects, which may damage propeller blades. These blades are available for propeller diameter 1600mm and 1680mm.

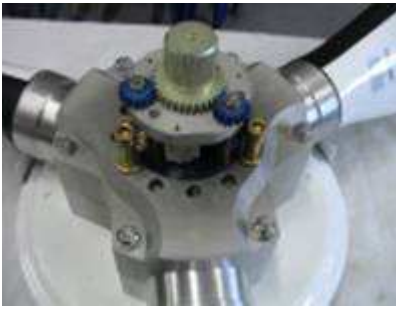
standard for MD3 Rider :

2. WOOD-COMPOSITE (WHITE) BLADES WITH PLASTIC LEADING EDGE.

For propeller blades with wooden core and glass-laminated surface in white or black colour, the leading edges of the blades are cast from highly resistant plastic material, which serves as protection against impact of sand, small stones, water and other effects, which damage propeller blades. These blades are available for propeller diameter 1600mm and 1680mm.

3. WOODEN BLADES WITH COMPOSITE LEADING EDGE.

Wooden propeller blades, that are equipped with leading edges made of highly resistant composite material, serving as protection against impact of sand, small stones, water and other effects, which damage propeller blades. The blade surface is protected with several spray coatings of very high quality and highly resistant polyurethane paint. The colour versions are TRANSPARENT or WHITE. These blades are available for blade diameters of 1450mm, 1500mm, and 1600mm and 1680mm.

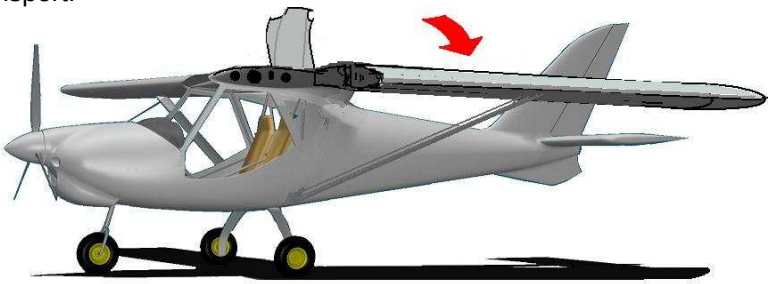


The propeller SR 200 can be equipped with a central adjusting mechanism, which makes it possible to adjust all three propeller blades simultaneously, by means of a single control element. This ensures that all three propeller blades are permanently adjusted to the same working angle.

8. AIRCRAFT HANDLING, CARE AND MAINTENANCE

8.1. Wing folding

Wing folding is an option to allow hangaring in a limited space or for transport.



The assembly procedure consists of:

- unlocking, opening and turning up the rear fuselage/baggage fairing
- disconnecting aileron controls and front wing hinges
- folding the wings including struts towards the fin
- fixing the wings including struts to the fin by using of separate transportation jig

8.1.1. UNLOCKING, OPENING AND TURNING UP THE REAR BAGGAGE FAIRING

Unlock and open CAMLOCKs of baggage door and fold it to the front.
Put a piece of foam under the gull-wing baggage door (between this and cabin ceiling)

8.1.2. DISCONNECTING AILERON CONTROLS AND FRONT WING HINGES

- It is necessary to disconnect aileron control rods ends from the wing horn levers before disconnection of wing hinges.
- Then disconnect front (main) wing hinge pin, accessible from the inside of cabin ceiling

8.1.3. FOLDING THE WINGS

2 persons are recommended to fold the wing.

CAUTION - Be careful - Set the ailerons and flaps into the neutral (0°) position before folding them to prevent the undesirable stressing of the connecting parts and control levers

With aileron control rods disconnected and front wing hinges pins dismounted the wing can be turned to push on the leading edge to the rear. Flaps control will be disconnected itself during movement.

Repeat the procedure with the second wing

For the transportation, we recommend to put the dismantled pins into the loosen forks of the wing hinges again and to lock them.

8.2. PARKING AND MOORING

8.2.1. General

Always secure the aircraft when parked. It is recommended to moor aircraft in worse weather conditions or when the aircraft is left unattended (overnight etc.)

Ground equipment:
- pressure sensor plug of the pitot static system
- securing set for mooring
- fabric covers

8.2.2. Pressure sensor plug for the pitot static system

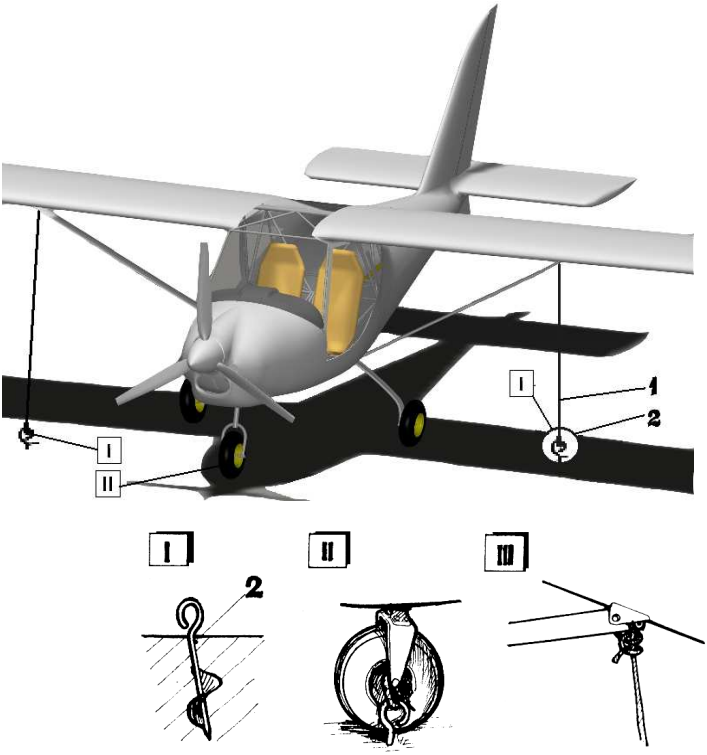
Pitot static system has to be protected against blowing air through by means of a rubber plug put on the input pipe of the pressure sensors. The plug is provided with a red flag.

8.2.3. Mooring

The airplane mooring equipment consists of the following:

- 3 mooring bolts
- 2 long and 1 short mooring cables

Mooring bolts should be screwed in the ground and the airplane should be moored by means of cables as shown below:



1 - Mooring cable
2 - Mooring bolt
3 - Cable to join stabilizers

I - Mooring ring(bolt) detail
II - Cable fixing to the landing gear hinge
III - Cable fixing to the wing hinge

8.3. Hangaring

Moving the airplane during hangaring, parking, etc. is recommended by pushing the empty airplane. Grip the fin cone of the airplane close to the fin and push it slightly down to lift the nose landing gear.

CAUTION – do not push the stabilizer to prevent damage

The airplane can be then controlled simple by side movements. If the assistance of further persons is needed, the wing struts near their hinges on the wing is the recommended positions for pushing the airplane.
Pushing or leaning on the control surface skin is forbidden.

8.4. Towing

Towing the airplane with a car is not allowed.

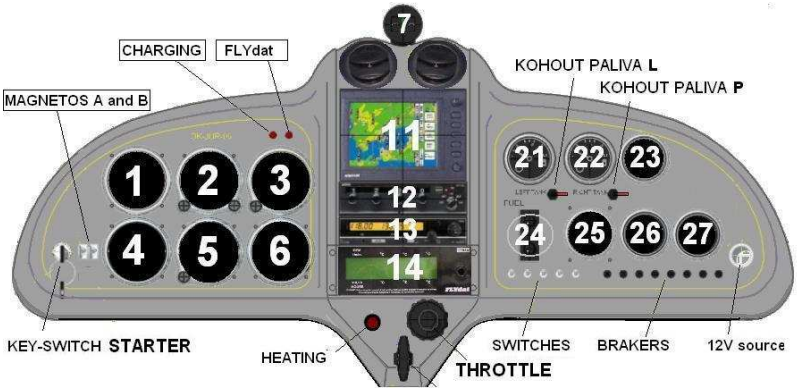
8.5. Tire pressure

Nose landing gear - 180 +20 kPa / 26,5 + 3 psi
Main landing gear - 180 +20 kPa / 26,5 + 3 psi

9. SUPPLEMENTS

- engine manual
- list of equipment
- weighing protocol
- nivelation protocol
- protocol about first test flight

INSTRUMENT PANEL definition of aircraft No.



FLIGHT INSTRUMENTS :

	INSTRUMENT	NAME	PRODUCTION NUMBER
1	**AIRSPEED INDICATOR**		
2			
3	**ALTIMETER**		
4			
5			
6			
7	**COMPASS**		

top mounted – *needed if some electric instruments are used in flight panel*

CENTRAL PANEL :

	INSTRUMENT	NAME	PRODUCTION NUMBER
11			
12			
13			
14	**FLYdat**		

POWERPLANT INSTRUMENTS :

	INSTRUMENT	NAME	PRODUCTION NUMBER
21	**FUEL GAUGE**	*Škoda120*	
22	**FUEL GAUGE**	*Škoda120*	
23			
24			
25			
26			
27			

COCKPIT EQUIPMENT

Throttle:

standard	**Fine screw – rod type**	
	Doubled rod type *(for schools)*	
	Lever throttle quadrant – with lever choke	

Flap control:

standard	**electric** *handler on middle column)*	
UL	**Hand lever** *– in ceiling between pilots*	

Rescue system installation:

type :		

Cockpit ventilation :

HEATING	
Cockpit side air vents	

producer :

installed - date: