

***SportCruiser***  
**Pilot's Operating Handbook**



**13. Valid to aircraft S/N:**

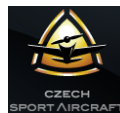
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# *SportCruiser*

## **Pilot's Operating Handbook**

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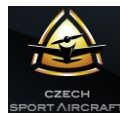
### 1.2 Record of revisions

Revision No.	Affected pages	Reason for revision	Date of Issue	Signature
1.0	All	Initial	01/2007	CH.W.E.
2.0	All	Pitot static probe change. Valid for Pitot static probe "AVIATIK" WA037383 only!	12/2007	CH.W.E.
2.1	All	Control surfaces deflection, formal faults removal. Valid for Pitot static probe "AVIATIK" WA037383 only!	07/2008	CH.W.E.
3.0	All	Reissue	04/2009	
3.2	1-3,1-4,1-5,1-6,2-10,2-11, 2-12,3-3,5-1,5-2,5-3,5-4,5-5, 5-6,5-7,5-8,5-9,5-10,5-11, 5-12,7-5,7-6, 7-7,7-9	Performance	11/2010	



### 1.3 List of effective pages

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1	1-1	04/2009	3	3-1	04/2009
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	1-3	11/2010		3-3	11/2010
	1-4	11/2010		3-4	04/2009
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# *SportCruiser*

## Pilot's Operating Handbook

### 1.4 General

*SportCruiser* is a Light Sport Aircraft (LSA) designed and built in :

**OFFICE AND PRODUCTION FACILITY:**

**CZECH SPORT AIRCRAFT A.S.**

**NA ZÁHONECH 1177/212**

**686 04 KUNOVICE**

**CZECH REPUBLIC**

**[www.czechsportaircraft.com](http://www.czechsportaircraft.com)**

Based on FAA Light Sport Aircraft category according to ASTM Standards F2245, F2279 and F 2295.

This Pilot's Operating Handbook has been prepared to provide pilots with information for the safe and efficient operation of *SportCruiser*. It also contains supplemental data supplied by the Aircraft Flight Training Supplement.

### 1.5 Warnings, cautions and notes

The following definitions apply to warnings, cautions and notes in the Pilot's Operating Handbook.

**WARNING**

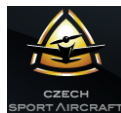
*Means that the non-observation of the corresponding procedure leads to an immediate or important degradation of the flight safety i.e. to injury or death of persons.*

**CAUTION**

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

**NOTE**

*Draws attention to any special item not directly related to safety but which is important or unusual.*



### **Throttle and Choke**

Engine power is controlled by means of the THROTTLE lever and the CHOKE lever which are positioned in the middle channel between the seats side by side. Both levers are mechanically connected (*by cable*) to the flap on the carburetors. Springs are added to the throttle push rods to ensure that the engine will go to full power if the linkages fail.

### **Carburetor preheating**

Heated air streaming from a heat exchanger to the carburetors through the airbox. The control lever is installed on the middle panel.

### **Heating**

Heating consists of a heat exchanger on the exhaust manifold and actuator located on the instrument panel.

#### **WARNING**

*Incidents involving exhaust gases entering the heating or ventilation system may result in fatal accidents due to carbon monoxide poisoning of the aircraft occupants. A carbon monoxide detector is recommended.*

### **Electrical system**

#### **Battery**

The 12 [V] battery is mounted on the front side of forward bulkhead.

#### **Master switch**

Master switch connects the electrical system to the 12 [V] battery.

#### **NOTE**

*Ignition system is independent of the power source and will operate even with Master switch and/or breaker off.*

#### **Ignition Switch**

Ignition switch must be on "BOTH" position to operate the engine. For safety remove the key when engine is not running.



### NOTE

All switches or engine controls are "up" or "push forward" for operation, except the choke, cabin heating and carburetor preheat, which is "Pull" for "On". Optional equipment, switches and/or circuit breakers are subject to change or installed as requested. See Aircraft Equipment List and Instrument panel layout and Description of equipment and controls in the cockpit.

### 2.3 Propeller

Standard **WOODCOMP KLASSIC 170/3/R** three composite blades ground adjustable propeller is installed.

Diameter .....68 [in] (1720 [mm])

Pitch setting ..... 17.5 ± 0.5°

### NOTE

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

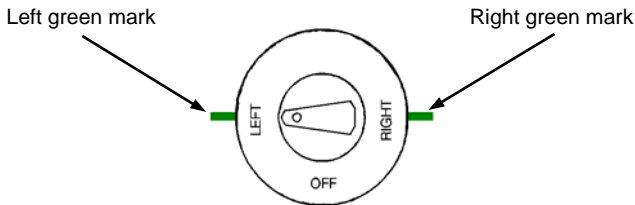
### 2.4 Fuel system

Each tank is equipped with a vent outlet, finger screen filter and float sensor. Drain valve located in the lowest point of the each tank and on the bottom edge of the bulkhead, on the gascollator.

Fuel selector valve is on the central console in the cockpit.

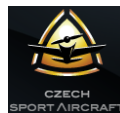
### CAUTION

During operation, fuel valve shall be in "LEFT" or "RIGHT" tank position (position on green mark).



The electric fuel pump is located on bulkhead and it is used for fuel line filling before engine starting.

Fuel return hose goes from the fuel pump into the left tank.



### NOTE

If left tank is full, start engine with the fuel selector set to **LEFT**. If you would start the engine with the fuel selector set to **RIGHT** and the left tank is full, than fuel bleed from the left tank vent may occur because a fuel return hose is led only into the left tank and returning fuel will overflow the left tank.

### CAUTION

Do not overfill the tanks to avoid fuel overflow through venting tubes.

### Recommended fuel type:

(refer to the ROTAX Operator's manual section 10.2.2 Fuel,  
Rotax Service Instruction SI-912-016)

#### MOGAS

European standard	- min. RON 95, EN 228 Super, EN 228 Super plus
US standard	- ASTM D4814
Canadian standard	- min. AKI 91, CAN/CGSB-3.5 Quality 3

### CAUTION

Fuels that contain more than 5% ethanol blend have not been tested and are not permitted for use.

#### AVGAS

US standard	- AVGAS 100 LL (ASTM D910)
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AVGAS 100 LL places greater stress on the valve seats due to its high lead content and forms increased deposits in the combustion chamber and lead sediments in the oil system. Thus it should only be used in case of problems with vapor lock or when other types of gasoline are unavailable.

#### Fuel volume:

Wing fuel tank volume .....	2x15.06 [US gal]	(2x57 [litre])
Unusable fuel quantity .....	2x0.13 [US gal]	(2x0.5 [litre])

## 2.5 Oil

### Oil type:

(refer to the Rotax Operator's manual section 10.2.3 Lubricants,  
Rotax Service Instruction SI-912-016)

Motorcycle 4-stroke engine oil of registered brand with gear additives.

Use only oil with API classification „SG“ or higher !

Use multi-grade oil. Use of mineral oil is not recommended.



### Type of oil used by aircrafts manufacturer:

- see Section 10 Supplement No. 02

### Oil volume:

Minimum.....	0.87 [US gal]	(3.3 [litre])
Maximum.....	1.0 [US gal]	(3.8 [litre])

## 2.6 Operating weights and loading

Empty weight (standard equipment) ..... 760 [lb] (345 [kg])

### NOTE

*Actual empty weight is shown in Section 10 Supplement No. 02*

Max. take-off weight.....	1,320 [lb]	(600 [kg])
Max landing weight.....	1,320 [lb]	(600 [kg])
Max. weight of fuel.....	180 [lb]	(82 [kg])
Max. baggage weight in rear fuselage.....	40 [lb]	(18 [kg])
Max. baggage weight in each wing locker.....	44 [lb]	(20 [kg])

### WARNING

Do not exceed maximum take-off weight 1,320 [lb] (600 [kg]) !

Number of seats.....	2	
Minimum crew.....	1 pilot on the left seat	
Minimum crew weight.....	95 [lb]	(43 [kg])
Maximum crew weight on each seat.....	253 [lb]	(115 [kg])



### 3.6 Crosswind and wind limitation

#### Demonstrated wind performance

Max. demonstrated head wind velocity for take-off and landing.....	24 [knot]
Max. demonstrated cross wind velocity for take-off and landing.....	12 [knot]

### 3.7 Service ceiling

Service ceiling .....	14,378 [ft]
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### 3.8 Load factor

Maximum positive limit load factor.....	+ 4 g
Maximum negative limit load factor .....	- 2 g

### 3.9 Prohibited maneuvers

**WARNING**

**AEROBATICS AND INTENTIONAL SPINS ARE PROHIBITED !**

**Airplane Category:** LSA

**The SportCruiser is approved for normal and below listed maneuvers:**

- Steep turns not exceeding 60° bank
- Lazy eights
- Chandelles
- Stalls (except whip stalls)



### 3.10 Engine operating speeds and limits

<b>Engine Model:</b>		<b>ROTAX 912 ULS</b>
<b>Engine Manufacturer:</b>		<b>Bombardier-Rotax GMBH</b>
<b>Power</b>	<i>Max. Take-off:</i>	<b>98.6 hp (73.5 kW) at 5,800 rpm (max. 5 min.)</b>
	<i>Max. Continuous:</i>	<b>92.5 hp (69 kW) at 5,500 rpm</b>
	<i>Cruising (75%):</i>	<b>68.4 hp (51 kW) at 5,000 rpm</b>
<b>Engine RPM</b>	<i>Max. Take-off:</i>	<b>5,800 rpm (max. 5 min)</b>
	<i>Max. Continuous:</i>	<b>5,500 rpm</b>
	<i>Cruising (75%):</i>	<b>5,000 rpm</b>
	<i>Idling:</i>	<b>1,400 rpm (minimum)</b>
<b>Oil pressure</b>	<i>Minimum:</i>	<b>12 psi (0.8 bar) below 3,500 rpm</b>
	<i>Maximum:</i>	<b>102 psi (7 bar) cold engine starting</b>
	<i>Optimum:</i>	<b>29 - 73 psi (2 - 5 bar) above 3,500 rpm</b>
<b>Oil temperature</b>	<i>Minimum:</i>	<b>122° F (50° C)</b>
	<i>Maximum:</i>	<b>266° F (130° C)</b>
	<i>Optimum:</i>	<b>194 - 230° F (90 - 110° C)</b>
<b>Cylinder head temper. (CHT)</b>	<i>Minimum:</i>	<b>122° F (50° C)</b>
	<i>Maximum:</i>	<b>275° F (135° C) *</b>
<b>Exhaust gas temperature (EGT)</b>	<i>Nominal:</i>	<b>1,472° F (800° C)</b>
	<i>Maximum:</i>	<b>1,562° F (850° C)</b>
	<i>Max. Take-off:</i>	<b>1,616° F (880° C)</b>
<b>Fuel press.</b>	<i>Minimum:</i>	<b>2.2 psi (0.15 bar)</b>
	<i>Maximum:</i>	<b>5.8 psi (0.4 bar)</b>

\* see the Rotax Operator's manual section 10.1.2 Operating speeds and limits and section 10.2.1 Coolant, Rotax Installation manual section 12 Cooling system, Rotax Service Instruction SI-912-016, POH Section 2 Coolant and Section 10 Supplement No. 02 Type of coolant used in engine.



## **SECTION 5**

### **5. PERFORMANCE**

<b>5.1 Take-off and landing distances</b>	<b>5-3</b>
<b>5.2 Rate of climb</b>	<b>5-3</b>
<b>5.3 Cruise speeds</b>	<b>5-4</b>
<b>5.4 RPM setting and Fuel consumption</b>	<b>5-5</b>
<b>5.5 Airspeed indicator system calibration</b>	<b>5-10</b>
<b>5.6 Demonstrated wind performance</b>	<b>5-11</b>



### 5. PERFORMANCE

The presented data has been computed from actual flight tests with the aircraft and engine in good conditions and using average piloting techniques. If not stated otherwise, the performance stated in this section is valid for maximum take-off weight (1,320 [lb] / 600 [kg]) and under ISA conditions.

The performance shown in this section is valid for aircraft equipped with **ROTAX 912 ULS** engine with maximum power 98.6 [hp] (73.5 [kW]) and **WOODCOMP KLASSIC 170/3/R** three composite blades ground adjustable propeller with pitch setting 17.5°.

#### **CAUTION**

*Airspeeds values are valid for standard AVIATIK WA037383 pitot-static probe.*

### 5.1 Take-off and landing distances

#### Take-off distances:

- Conditions:**
- Altitude: 0 ft ISA
  - Engine power: full throttle
  - Flaps: 15°

RUNWAY SURFACE	Take-off run distance	Take-off distance over 50 ft obstacle
	ft	ft
CONCRETE	463	1,270
GRASS	702	1,499

#### Landing distances:

- Conditions:**
- Altitude: 0 ft ISA
  - Engine power: idle
  - Flaps: 30°
  - Brakes fully depressed immediately after touch-down

RUNWAY SURFACE	Landing distance over 50 ft obstacle	Landing run distance (braked)
	ft	ft
CONCRETE	1,188	479
GRASS	1,109	364

### 5.2 Rate of climb

Conditions: Engine: full throttle Flaps: 0°	Best rate of climb speed Vy (IAS)		Rate of climb Vz
	knot	mph	fpm
<b>Altitude</b>			
<b>0 ft</b>	62	71	825
<b>3000 ft</b>	62	71	685
<b>6000 ft</b>	62	71	540
<b>9000 ft</b>	62	71	355



### 5.3 Cruise speeds

Altitude	Engine speed	IAS		CAS		TAS		MAP	Fuel consumption
		knot	mph	knot	mph	knot	mph		
ft	rpm							in Hg	US gal/h
<b>1,000</b>	4,200	72	83	72	83	73	84	23.7	3.59
	4,500	81	93	80	92	81	93	24.6	4.15
	4,800	91	105	89	102	89	102	25.5	4.76
	5,000	96	110	94	108	95	109	26.1	5.15
	5,300	105	121	102	117	103	118	27.0	5.79
	5,500	112	129	108	124	109	125	27.7	6.26
	5,700	118	136	113	130	114	131	28.3	6.82
<b>3,000</b>	4,200	68	78	69	79	72	83	22.2	3.49
	4,500	78	90	77	89	80	92	23.0	4.04
	4,800	86	99	85	98	88	101	23.8	4.62
	5,000	93	107	91	105	94	108	24.3	5.02
	5,300	102	117	99	114	102	117	25.1	5.65
	5,500	108	124	104	120	108	124	25.5	6.16
<b>5,000</b>	4,200	65	75	66	76	71	82	20.5	3.41
	4,500	74	85	74	85	79	91	21.3	3.94
	4,800	83	95	82	94	87	100	22.1	4.54
	5,000	89	102	87	100	93	107	22.7	4.94
	5,300	97	112	95	109	101	116	23.5	5.57
	5,500	103	118	100	115	107	123	24.1	6.02
<b>7,000</b>	4,200	62	71	63	72	69	79	19.3	3.30
	4,500	69	79	70	81	77	89	20.0	3.86
	4,800	79	91	78	90	85	98	20.6	4.44
	5,000	84	97	83	95	91	105	21.2	4.86
	5,300	92	106	90	104	99	114	22.0	5.49
	5,500	98	113	95	109	105	121	22.5	5.89
<b>9,000</b>	4,200	57	66	59	68	67	77	18.4	3.22
	4,500	64	74	65	75	74	85	19.0	3.78
	4,800	73	84	73	84	83	95	19.6	4.33
	5,000	79	91	78	90	89	102	20.0	4.76
	5,300	86	99	85	98	97	112	20.5	5.39
	5,500	92	106	90	104	103	118	20.8	5.76

### 5.4 RPM setting and Fuel consumption

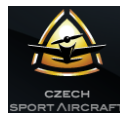
Altitude		ft	1,000					
Engine speed		<i>rpm</i>	<b>4,200</b>	<b>4,500</b>	<b>4,800</b>	<b>5,000</b>	<b>5,300</b>	<b>5,500</b>
Fuel consumption		<i>US gal/h</i>	3.59	4.15	4.76	5.15	5.79	6.26
		<i>l/h</i>	13.6	15.7	18.0	19.5	21.9	23.7
Airspeed	IAS	<i>knot</i>	72	81	91	96	105	112
		<i>mph</i>	83	93	105	110	121	129
	CAS	<i>knot</i>	72	80	89	94	102	108
		<i>mph</i>	83	92	102	108	117	124
	TAS	<i>knot</i>	73	81	89	95	103	109
		<i>mph</i>	84	93	102	109	118	125
<b>Endurance and Range at 29.85 US gal (113 liters)</b>								
Endurance		<i>hh:mm</i>	8:18	7:11	6:16	5:47	5:09	4:46
Range		<i>NM</i>	607	583	558	551	531	520
		<i>SM</i>	698	670	642	633	611	598
<b>Endurance and Range at 23.78US gal (90 liters)</b>								
Endurance		<i>hh:mm</i>	6:37	5:43	4:59	4:36	4:06	3:47
Range		<i>NM</i>	483	464	445	439	423	414
		<i>SM</i>	556	534	511	504	486	476
<b>Endurance and Range at 15.85 US gal (60 liters)</b>								
Endurance		<i>hh:mm</i>	4:24	3:49	3:19	3:04	2:44	2:31
Range		<i>NM</i>	322	309	296	292	282	276
		<i>SM</i>	371	356	341	336	324	317
<b>Endurance and Range at 7.93US gal (30 liters)</b>								
Endurance		<i>hh:mm</i>	2:12	1:54	1:39	1:32	1:22	1:15
Range		<i>NM</i>	161	155	148	146	141	138
		<i>SM</i>	185	178	170	168	162	159
<b>Endurance and Range at 3.96 US gal (15 liters)</b>								
Endurance		<i>hh:mm</i>	1:06	0:57	0:49	0:46	0:41	0:37
Range		<i>NM</i>	81	77	74	73	70	69
		<i>SM</i>	93	89	85	84	81	79



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Altitude	ft	<b>3,000</b>						
Engine speed	<i>rpm</i>	<b>4,200</b>	<b>4,500</b>	<b>4,800</b>	<b>5,000</b>	<b>5,300</b>	<b>5,500</b>	
Fuel consumption	<i>US gal/h</i>	3.49	4.04	4.62	5.02	5.65	6.16	
	<i>l/h</i>	13.2	15.3	17.5	19.0	21.4	23.3	
Airspeed	IAS	<i>knot</i>	68	78	86	93	102	108
		<i>mph</i>	78	90	99	107	117	124
	CAS	<i>knot</i>	69	77	85	91	99	104
		<i>mph</i>	79	89	98	105	114	120
	TAS	<i>knot</i>	72	80	89	95	103	109
		<i>mph</i>	83	92	101	108	117	124
<b>Endurance and Range at 29.85 US gal (113 liters)</b>								
Endurance	<i>hh:mm</i>	8:33	7:23	6:27	5:56	5:17	4:50	
Range	<i>NM</i>	616	591	569	559	539	523	
	<i>SM</i>	708	680	654	643	620	602	
<b>Endurance and Range at 23.78 US gal (90 liters)</b>								
Endurance	<i>hh:mm</i>	6:48	5:53	5:08	4:44	4:12	3:51	
Range	<i>NM</i>	490	471	453	445	429	417	
	<i>SM</i>	564	541	521	512	494	479	
<b>Endurance and Range at 15.85 US gal (60 liters)</b>								
Endurance	<i>hh:mm</i>	4:32	3:55	3:25	3:09	2:48	2:34	
Range	<i>NM</i>	327	314	302	297	286	278	
	<i>SM</i>	376	361	347	341	329	320	
<b>Endurance and Range at 7.93 US gal (30 liters)</b>								
Endurance	<i>hh:mm</i>	2:16	1:57	1:42	1:34	1:24	1:17	
Range	<i>NM</i>	163	157	151	148	143	139	
	<i>SM</i>	188	180	174	171	165	160	
<b>Endurance and Range at 3.96 US gal (15 liters)</b>								
Endurance	<i>hh:mm</i>	1:08	0:58	0:51	0:47	0:42	0:38	
Range	<i>NM</i>	82	78	75	74	72	69	
	<i>SM</i>	94	90	87	85	82	80	



Altitude		ft	5,000					
Engine speed		<i>rpm</i>	<b>4,200</b>	<b>4,500</b>	<b>4,800</b>	<b>5,000</b>	<b>5,300</b>	<b>5,500</b>
Fuel consumption		<i>US gal/h</i>	3.41	3.94	4.54	4.94	5.57	6.02
		<i>l/h</i>	12.9	14.9	17.2	18.7	21.1	22.8
Airspeed	IAS	<i>knot</i>	65	74	83	89	97	103
		<i>mph</i>	75	85	95	102	112	118
	CAS	<i>knot</i>	66	74	82	87	95	100
		<i>mph</i>	76	85	94	100	109	115
	TAS	<i>knot</i>	71	79	87	93	101	107
		<i>mph</i>	82	91	100	107	116	123
<b>Endurance and Range at 29.85 US gal (113 liters)</b>								
Endurance		<i>hh:mm</i>	8:45	7:34	6:34	6:02	5:21	4:57
Range		<i>NM</i>	622	599	572	562	541	531
		<i>SM</i>	715	688	658	646	622	610
<b>Endurance and Range at 23.78 US gal (90 liters)</b>								
Endurance		<i>hh:mm</i>	6:58	6:02	5:14	4:48	4:16	3:56
Range		<i>NM</i>	495	477	456	448	431	423
		<i>SM</i>	569	548	524	515	496	486
<b>Endurance and Range at 15.85 US gal (60 liters)</b>								
Endurance		<i>hh:mm</i>	4:38	4:01	3:29	3:12	2:50	2:37
Range		<i>NM</i>	330	318	304	298	287	282
		<i>SM</i>	380	365	349	343	331	324
<b>Endurance and Range at 7.93 US gal (30 liters)</b>								
Endurance		<i>hh:mm</i>	2:19	2:00	1:44	1:36	1:25	1:18
Range		<i>NM</i>	165	159	152	149	144	141
		<i>SM</i>	190	183	175	172	165	162
<b>Endurance and Range at 3.96 US gal (15 liters)</b>								
Endurance		<i>hh:mm</i>	1:09	1:00	0:52	0:48	0:42	0:39
Range		<i>NM</i>	83	79	76	75	72	70
		<i>SM</i>	95	91	87	86	83	81



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Altitude	ft	7,000						
Engine speed	<i>rpm</i>	<b>4,200</b>	<b>4,500</b>	<b>4,800</b>	<b>5,000</b>	<b>5,300</b>	<b>5,500</b>	
Fuel consumption	<i>US gal/h</i>	3.30	3.86	4.44	4.86	5.49	5.89	
	<i>l/h</i>	12.5	14.6	16.8	18.4	20.8	22.3	
Airspeed	IAS	<i>knot</i>	62	69	79	84	92	98
		<i>mph</i>	71	79	91	97	106	113
	CAS	<i>knot</i>	63	70	78	83	90	95
		<i>mph</i>	72	81	90	95	104	109
	TAS	<i>knot</i>	69	77	85	91	99	105
		<i>mph</i>	79	89	98	105	114	121
<b>Endurance and Range at 29.85 US gal (113 liters)</b>								
Endurance	<i>hh:mm</i>	9:02	7:44	6:43	6:08	5:26	5:04	
Range	<i>NM</i>	624	595	571	559	538	532	
	<i>SM</i>	718	685	657	643	619	612	
<b>Endurance and Range at 23.78 US gal (90 liters)</b>								
Endurance	<i>hh:mm</i>	7:12	6:09	5:21	4:53	4:19	4:02	
Range	<i>NM</i>	497	474	455	445	429	424	
	<i>SM</i>	572	545	523	512	493	487	
<b>Endurance and Range at 15.85 US gal (60 liters)</b>								
Endurance	<i>hh:mm</i>	4:48	4:06	3:34	3:15	2:53	2:41	
Range	<i>NM</i>	331	316	303	297	286	283	
	<i>SM</i>	381	364	349	341	329	325	
<b>Endurance and Range at 7.93 US gal (30 liters)</b>								
Endurance	<i>hh:mm</i>	2:24	2:03	1:47	1:37	1:26	1:20	
Range	<i>NM</i>	166	158	152	148	143	141	
	<i>SM</i>	191	182	174	171	164	162	
<b>Endurance and Range at 3.96 US gal (15 liters)</b>								
Endurance	<i>hh:mm</i>	1:12	1:01	0:53	0:48	0:43	0:40	
Range	<i>NM</i>	83	79	76	74	71	71	
	<i>SM</i>	95	91	87	85	82	81	

Altitude		ft	<b>9,000</b>					
Engine speed		<i>rpm</i>	<b>4,200</b>	<b>4,500</b>	<b>4,800</b>	<b>5,000</b>	<b>5,300</b>	<b>5,500</b>
Fuel consumption		<i>US gal/h</i>	3.22	3.78	4.33	4.76	5.39	5.76
		<i>l/h</i>	12.2	14.3	16.4	18.0	20.4	21.8
Airspeed	IAS	<i>knot</i>	57	64	73	79	86	92
		<i>mph</i>	66	74	84	91	99	106
	CAS	<i>knot</i>	59	65	73	78	85	90
		<i>mph</i>	68	75	84	90	98	104
	TAS	<i>knot</i>	67	74	83	89	97	103
		<i>mph</i>	77	85	95	102	112	118
<b>Endurance and Range at 29.85 US gal (113 liters)</b>								
Endurance		<i>hh:mm</i>	9:16	7:53	6:53	6:16	5:32	5:10
Range		<i>NM</i>	621	584	572	558	537	534
		<i>SM</i>	714	672	658	642	618	614
<b>Endurance and Range at 23.78 US gal (90 liters)</b>								
Endurance		<i>hh:mm</i>	7:23	6:17	5:29	4:59	4:24	4:07
Range		<i>NM</i>	495	465	456	445	428	425
		<i>SM</i>	569	535	524	511	492	489
<b>Endurance and Range at 15.85 US gal (60 liters)</b>								
Endurance		<i>hh:mm</i>	4:55	4:11	3:39	3:19	2:56	2:45
Range		<i>NM</i>	330	310	304	296	285	283
		<i>SM</i>	379	357	349	341	328	326
<b>Endurance and Range at 7.93 US gal (30 liters)</b>								
Endurance		<i>hh:mm</i>	2:27	2:05	1:49	1:39	1:28	1:22
Range		<i>NM</i>	165	155	152	148	143	142
		<i>SM</i>	190	178	175	170	164	163
<b>Endurance and Range at 3.96 US gal (15 liters)</b>								
Endurance		<i>hh:mm</i>	1:13	1:02	0:54	0:49	0:44	0:41
Range		<i>NM</i>	82	78	76	74	71	71
		<i>SM</i>	95	89	87	85	82	81



### 5.5 Airspeed indicator system calibration

IAS	CAS
<i>knot</i>	
30	35
35	39
40	44
45	48
50	53
55	57
60	62
65	66
70	71
75	75
80	79
85	84
90	88
95	93
100	97
105	102
110	106
115	111
120	115
125	120
130	124
135	129
140	133

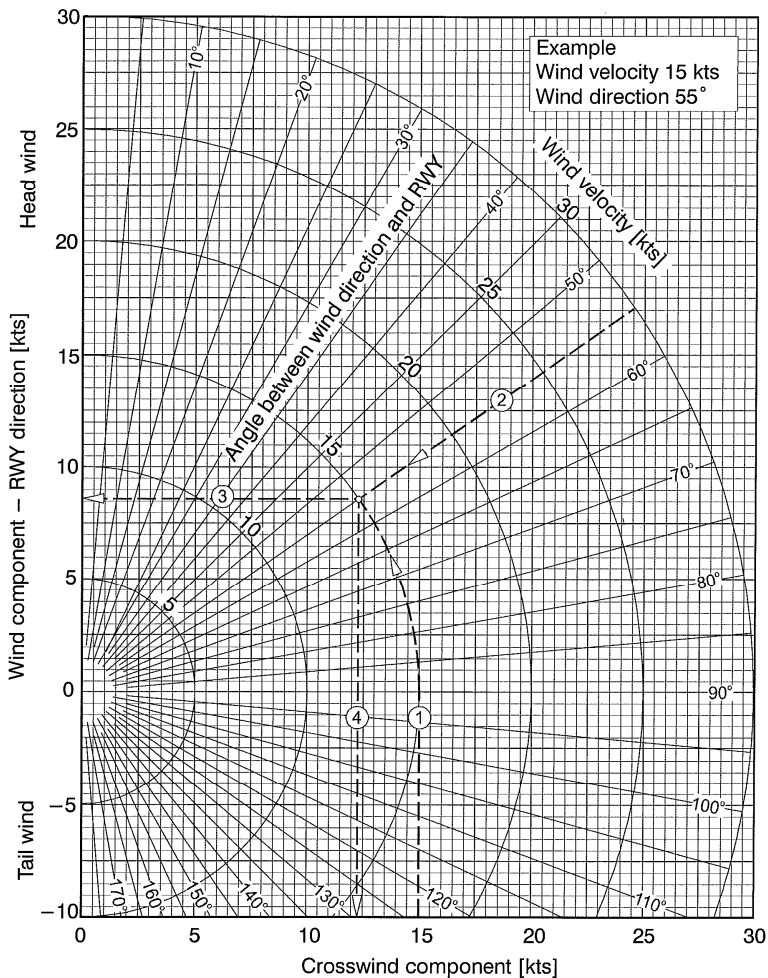
IAS	CAS
<i>km/h</i>	
55	64
60	68
70	77
80	86
90	95
100	104
110	113
120	122
130	131
140	140
150	149
160	158
170	167
180	176
190	185
200	194
210	203
220	212
230	221
240	230
250	239
255	243

### 5.6 Demonstrated wind performance

Max. demonstrated headwind velocity for take-off and landing: 24 [knot]

Max. demonstrated crosswind velocity for take-off and landing: 12 [knot]

#### Wind components figure



**Example:**

1. Wind velocity ..... 15 knots	3. Headwind component ..... 8.6 knots
2. Wind direction ..... 55°	4. Crosswind component ..... 12.3 knots



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*Intentionally left blank*

### CAUTION

The starter should be activated for a maximum of 10 [sec], followed by 2 [min] pause for engine cooling.

As soon as engine runs, adjust throttle to achieve smooth running at approx. 2500 [rpm]. Check the oil pressure, which should increase within 10 [sec]. Increase the engine speed after the oil pressure has reached 2 [bar] (29 [psi]) and is steady.

To avoid shock loading, start the engine with the throttle lever set for idling or 10 % open at maximum, then wait 3 [sec] to reach constant engine speed before new acceleration.

Only one magneto should be switched on (off) during ignition magneto check.

### 7.2.3 Engine warm up, Engine check

Prior to engine check block the main wheels using chocks. Initially warm up the engine to 2000 [rpm] for approximately 2 [min], then continue to 2500 [rpm] till oil temperature reaches 122 [°F] (50 [°C]). The warm up period depends on ambient air temperature.

Check both ignition circuits at 4000 [rpm] for Rotax 912 ULS. The engine speed drop during the time either magneto switched off should not over 300 [rpm]. The Max. engine speed drop difference between circuits L and R should be 115 [rpm].

### NOTE

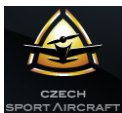
Only one magneto should be switched on (off) during ignition magneto check.

Set max. power for verification of max. static engine speed (5,000 ±100 [rpm]) with given propeller and engine parameters (temperatures and pressures).

Check acceleration from idling to max. power. If necessary, cool the engine at idle [rpm] before shutdown.

### CAUTION

The engine check should be performed with the aircraft heading upwind and not on a loose terrain (the propeller may suck grit which can damage the leading edges of blades).



### 7.3 Taxiing

Apply power and brakes as needed. Apply brakes to control movement on ground. Taxi carefully when wind velocity exceeds 20 [knot]. Hold the control stick in neutral position.

### 7.4 Normal Take-off

#### 7.4.1 Before take-off

1. Altimeter - set
2. Trim - set neutral position
3. Control system - check free movement
4. Cockpit canopy - closed and locked

**Recommendation:** - *Before takeoff, manually check the canopy is locked by pushing the canopy upwards.*

5. Safety harness - tighten
6. Fuel Selector - turn on (*left or right fuel tank*)
7. Ignition switch - switched on (*both magnetos*)
8. Wing flaps - extend as necessary

#### 7.4.2 Take-off

1. Brakes - apply to stop wheel rotation
2. Throttle - fully forward
3. Engine speed - check (*5,000 ±100 [rpm]*)
4. Instruments within limits - check
5. Brakes - release
6. Nose wheel unstick - *32 [knot] (37 [mph])*
7. Airplane lift-off - *42 [knot] (48 [mph])*
8. Passing to climb - after reaching airspeed *65 [knot] (75 [mph])*
9. Wing flaps - retract at safe altitude (*max. airspeed for flaps using is 75 [knot], 86 [mph]*)



### WARNING

The Take-off is prohibited if:

- The engine is running unsteadily
- The engine instruments values are beyond operational limits
- The crosswind velocity exceeds permitted limits (see section 3.6)

## 7.5 Climb

- |                |   |
|----------------|---|
| 1. Throttle    | - fully forward<br>(max. 5800 [rpm] for max. 5 [min])<br>max. continue power (5500 [rpm]) |
| 2. Airspeed    | - $v_x = 56$ [knot] (64 [mph])<br>- $v_y = 62$ [knot] (71 [mph])                          |
| 3. Trim        | - trim the airplane   |
| 4. Instruments | - oil temperature, oil pressure and<br>CHT within limits                                  |

### CAUTION

If the cylinder head temperature or oil temperature and/or coolant temperature approaches or exceeds limits, reduce the climb angle to increase airspeed and possibly return within limits. If readings do not improve, troubleshoot causes other than high power setting at low airspeed.

**7.5.1 Best angle of climb speed( $v_x$ ):** 56 [knot] (64 [mph])

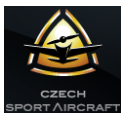
**7.5.2 Best rate of climb speed( $v_y$ ):** 62 [knot] (71 [mph])

## 7.6 Cruise

Refer to Section 5, for recommended cruising figures

## 7.7 Descend

Optimum glide speed - 60 [knot] (70 [mph])



### 7.8 Approach

- Approach speed - 60 [knot] (70 [mph])
1. Throttle - as necessary
  2. Wing flaps - extend as necessary
  3. Trim - as necessary

#### **CAUTION**

*It is not advisable to reduce the engine throttle control lever to minimum on final approach and when descending from very high altitude. In such cases the engine becomes under-cooled and a loss of power may occur. Descent at increased idle (approximately 3000 [rpm]), speed between 60-75 [knot] (70-86 [mph]) and check that the engine instruments indicate values within permitted limits.*

### 7.9 Normal landing

#### 7.9.1 Before landing

1. Throttle - as necessary
2. Airspeed - 60 [knot] (70 [mph])
3. Wing flaps - extend as necessary
4. Trim - as necessary

#### 7.9.2 Landing

1. Throttle - idle
2. Touch-down on main wheels
3. Apply brakes (after the nose wheel touch-down) - as necessary

#### 7.9.3 After landing

1. Throttle - engine rpm set as required for taxiing
2. Wing flaps - retract
3. Trim - set neutral position

### 7.9.4 Engine shut down

- |                      |   |
|----------------------|---|
| 1. Throttle          | - idle  |
| 2. Instruments       | - engine instruments within limits                      |
| 3. Switches          | - switch off except <b>Instrument</b> and <b>Master</b> |
| 4. Ignition switch   | - turn key to switch off                                |
| 5. Instrument switch | - switch off  |
| 6. Master switch     | - switch off  |
| 7. Fuel Selector     | - close   |

#### CAUTION

Rapid engine cooling should be avoided during operation. This happens above all during aircraft descent, taxiing, low engine rpm or at engine shutdown immediately after landing. Under normal conditions the engine temperatures stabilize during descent, taxiing and at values suitable to stop engine by switching the ignition off. If necessary, cool the engine at *idle [rpm]* to stabilize the temperatures prior to engine shut down.

### 7.10 Short field take-off and landing procedures

None

### 7.11 Balked landing procedures

- |                          |   |
|--------------------------|---|
| 1. Throttle              | - fully forward<br>(max. 5800 [rpm] for max. 5 [min],<br>max. continuous power (5,500 [rpm])) |
| 2. Passing to climb      | - after reaching 65 [knot] (75 [mph])   |
| 3. Trim                  | - adjust as necessary   |
| 4. Wing flaps            | - retract at safe altitude<br>(max. airspeed for flaps using is<br>75 [knot], 86 [mph])       |
| 5. Trim                  | - adjust as necessary   |
| 6. Repeat circle pattern |   |



### 7.12 Aircraft parking and tie-down

1. Ignition switch - OFF
2. Master switch - OFF
3. Fuel selector - close
4. Parking brake - use it as necessary (if installed)
5. Canopy - close, lock as necessary
6. Secure the airplane

#### **NOTE**

*It is recommended to use parking brake (if installed) for short-time parking only, between flights during a flight day. After ending the flight day or at low temperatures of ambient air, do not use parking brake, but use the wheel chocks instead.*

#### **NOTE**

*Use anchor eyes on the wings and fuselage rear section to fix the airplane. Move control stick forward and fix it together with the rudder pedals. Make sure that the cockpit canopy is properly closed and locked. The anchoring before leaving the airplane is important if the airplane is not equipped with a parking brake.*