

# *SportCruiser*

## Pilot's Operating Handbook



### **8. Valid to aircraft S/N:**

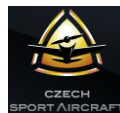
09SC287, 09SC294, 09SC295, 09SC303





# *SportCruiser*

## **Pilot's Operating Handbook**

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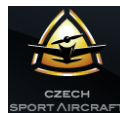
### 1.2 Record of revisions

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, 2-12,3-3,3-5,1-5-2,5-3,5-4,5-5, 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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			10-4	04/2009	



# *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**

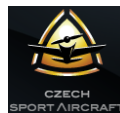
*Means that the non-observation of the corresponding procedure leads to an immediate or important degradation of the flight safety i.e. to injury or death of persons.*

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

Pitch setting ..... 17.5 ± 0.5°

### NOTE

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

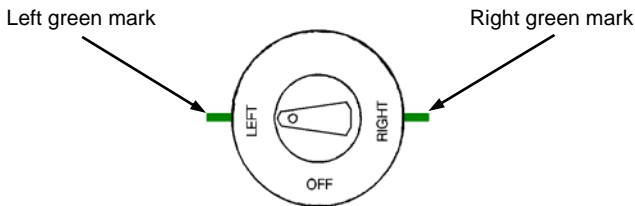
## 2.4 Fuel system

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

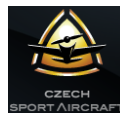
During operation, fuel valve shall be in "LEFT" or "RIGHT" tank position (position on green mark).



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)

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

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

## 2.6 Operating weights and loading

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

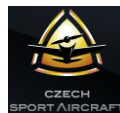
*Actual empty weight is shown in Section 10 Supplement No. 02*

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

### WARNING

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

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



### 3.6 Crosswind and wind limitation

#### Demonstrated wind performance

Max. demonstrated head wind velocity for take-off and landing.....	24 [knot] (13 [m/s])
Max. demonstrated cross wind velocity for take-off and landing.....	12 [knot] (6.5 [m/s])

### 3.7 Service ceiling

Service ceiling .....	14,378 [ft] (4,382 [m])
-----------------------	-------------------------

### 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>	<b>Max. Take-off:</b>	<b>73.5 kW (98.6 hp) at 5800 rpm (max. 5 min.)</b>
	<b>Max. Continuous:</b>	<b>69 kW (92.5 hp) at 5500 rpm</b>
	<b>Cruising (75%):</b>	<b>51 kW (68.4 hp) at 5000 rpm</b>
<b>Engine RPM</b>	<b>Max. Take-off:</b>	<b>5800 rpm (max. 5 min.)</b>
	<b>Max. Continuous:</b>	<b>5500 rpm</b>
	<b>Cruising (75%):</b>	<b>5000 rpm</b>
	<b>Idling:</b>	<b>1400 rpm (minimum)</b>
<b>Oil pressure</b>	<b>Minimum:</b>	<b>0.8 bar (12 psi) below 3500 rpm</b>
	<b>Maximum:</b>	<b>7 bar (102 psi) cold engine starting</b>
	<b>Optimum:</b>	<b>2 - 5 bar (29 - 73 psi) above 3500 rpm</b>
<b>Oil temperature</b>	<b>Minimum:</b>	<b>50° C (122° F)</b>
	<b>Maximum:</b>	<b>130° C (266° F)</b>
	<b>Optimum:</b>	<b>90 - 110° C (194 - 230° F)</b>
<b>Cylinder head temper. (CHT)</b>	<b>Minimum:</b>	<b>50° C (122° F)</b>
	<b>Maximum:</b>	<b>135° C (275° F) *</b>
<b>Exhaust gas temperature (EGT)</b>	<b>Nominal:</b>	<b>800° C (1472° F)</b>
	<b>Maximum:</b>	<b>850° C (1562° F)</b>
	<b>Max. Take-off:</b>	<b>880° C (1616° F)</b>
<b>Fuel press.</b>	<b>Minimum:</b>	<b>0.15 bar (2.2 psi)</b>
	<b>Maximum:</b>	<b>0.4 bar (5.8 psi)</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

5.1 Take-off and landing distances	5-3
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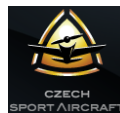
### 5. PERFORMANCE

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 (600 [kg]/1,320 [lb]) and under ISA conditions.

The performance shown in this section is valid for aircraft equipped with **ROTAX 912 ULS** engine with maximum power 73.5 [kW] (98.6 [hp]) 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 (15 m) obstacle	
	ft	m	ft	m
CONCRETE	463	141	1,270	387
GRASS	702	214	1,499	457

#### 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 (15 m) obstacle		Landing run distance (braked)	
	ft	m	ft	m
CONCRETE	1,188	362	479	146
GRASS	1,109	338	364	111

### 5.2 Rate of climb

Conditions: Engine: full throttle Flaps: 0°	Best rate of climb speed Vy (IAS)		Rate of climb Vz	
	knot	km/h	fpm	m/s
Altitude				
0 ft	62	115	825	4.2
3000 ft	62	115	685	3.5
6000 ft	62	115	540	2.7
9000 ft	62	115	355	1.8



### 5.3 Cruise speeds

Altitude	Engine speed	IAS		CAS		TAS		MAP	Fuel consumption	
		knot	km/h	knot	km/h	knot	km/h		in Hg	l/h
ft	rpm									
<b>1,000</b>	4,200	72	133	72	133	73	135	23.7	13.6	3.59
	4,500	81	150	80	148	81	150	24.6	15.7	4.15
	4,800	91	169	89	165	89	165	25.5	18.0	4.76
	5,000	96	178	94	174	95	176	26.1	19.5	5.15
	5,300	105	194	102	189	103	191	27.0	21.9	5.79
	5,500	112	207	108	200	109	202	27.7	23.7	6.26
	5,700	118	219	113	209	114	211	28.3	25.8	6.82
<b>3,000</b>	4,200	68	126	69	128	72	133	22.2	13.2	3.49
	4,500	78	144	77	143	80	148	23.0	15.3	4.04
	4,800	86	159	85	157	88	163	23.8	17.5	4.62
	5,000	93	172	91	169	94	174	24.3	19.0	5.02
	5,300	102	189	99	183	102	189	25.1	21.4	5.65
	5,500	108	200	104	193	108	200	25.5	23.3	6.16
<b>5,000</b>	4,200	65	120	66	122	71	131	20.5	12.9	3.41
	4,500	74	137	74	137	79	146	21.3	14.9	3.94
	4,800	83	154	82	152	87	161	22.1	17.2	4.54
	5,000	89	165	87	161	93	172	22.7	18.7	4.94
	5,300	97	180	95	176	101	187	23.5	21.1	5.57
	5,500	103	191	100	185	107	198	24.1	22.8	6.02
<b>7,000</b>	4,200	62	115	63	117	69	128	19.3	12.5	3.30
	4,500	69	128	70	130	77	143	20.0	14.6	3.86
	4,800	79	146	78	144	85	157	20.6	16.8	4.44
	5,000	84	156	83	154	91	169	21.2	18.4	4.86
	5,300	92	170	90	167	99	183	22.0	20.8	5.49
	5,500	98	181	95	176	105	194	22.5	22.3	5.89
<b>9,000</b>	4,200	57	106	59	109	67	124	18.4	12.2	3.22
	4,500	64	119	65	120	74	137	19.0	14.3	3.86
	4,800	73	135	73	135	83	154	19.6	16.4	4.33
	5,000	79	146	78	144	89	165	20.0	18.0	4.76
	5,300	86	159	85	157	97	180	20.5	20.4	5.39
	5,500	92	170	90	167	103	191	20.8	21.8	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>l/h</i>	13.6	15.7	18.0	19.5	21.9	23.7
		<i>US gal/h</i>	3.59	4.15	4.76	5.15	5.79	6.26
Airspeed	IAS	<i>knot</i>	72	81	91	96	105	112
		<i>km/h</i>	133	150	169	178	194	207
	CAS	<i>knot</i>	72	80	89	94	102	108
		<i>km/h</i>	133	148	165	174	189	200
	TAS	<i>knot</i>	73	81	89	95	103	109
		<i>km/h</i>	135	150	165	176	191	202
<b>Endurance and Range at 113 liters (29.85 US gal)</b>								
Endurance		<i>hh:mm</i>	8:18	7:11	6:16	5:47	5:09	4:46
Range		<i>NM</i>	607	583	559	551	531	520
		<i>km</i>	1123	1080	1035	1020	984	962
<b>Endurance and Range at 90 liters (23.77 US gal)</b>								
Endurance		<i>hh:mm</i>	6:37	5:43	5:00	4:36	4:06	3:47
Range		<i>NM</i>	483	464	445	438	423	414
		<i>km</i>	895	860	824	812	784	767
<b>Endurance and Range at 60 liters (15.85 US gal)</b>								
Endurance		<i>hh:mm</i>	4:24	3:49	3:20	3:04	2:44	2:31
Range		<i>NM</i>	322	310	297	292	282	276
		<i>km</i>	596	573	549	541	523	511
<b>Endurance and Range at 30 liters (7.92 US gal)</b>								
Endurance		<i>hh:mm</i>	2:12	1:54	1:40	1:32	1:22	1:15
Range		<i>NM</i>	161	155	148	146	141	138
		<i>km</i>	298	287	275	271	261	256
<b>Endurance and Range at 15 liters (3.96 US gal)</b>								
Endurance		<i>hh:mm</i>	1:06	0:57	0:50	0:46	0:41	0:37
Range		<i>NM</i>	81	77	74	73	71	69
		<i>km</i>	149	143	137	135	131	128



Altitude		ft	3,000					
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>l/h</i>	13.2	15.3	17.5	19.0	21.4	23.3
		<i>US gal/h</i>	3.49	4.04	4.62	5.02	5.65	6.16
Airspeed	IAS	<i>knot</i>	68	78	86	93	102	108
		<i>km/h</i>	126	144	159	172	189	200
	CAS	<i>knot</i>	69	77	85	91	99	104
		<i>km/h</i>	128	143	157	169	183	193
	TAS	<i>knot</i>	72	80	89	95	103	109
		<i>km/h</i>	133	148	165	176	191	202
<b>Endurance and Range at 113 liters (29.85 US gal)</b>								
Endurance		<i>hh:mm</i>	8:33	7:23	6:27	5:56	5:16	4:50
Range		<i>NM</i>	616	591	568	559	539	524
		<i>km</i>	1142	1094	1052	1035	997	970
<b>Endurance and Range at 90 liters (23.77 US gal)</b>								
Endurance		<i>hh:mm</i>	6:49	5:52	5:08	4:44	4:12	3:51
Range		<i>NM</i>	491	471	453	445	429	417
		<i>km</i>	909	872	838	825	794	773
<b>Endurance and Range at 60 liters (15.85 US gal)</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>km</i>	606	581	559	550	530	515
<b>Endurance and Range at 30 liters (7.92 US gal)</b>								
Endurance		<i>hh:mm</i>	2:16	1:57	1:42	1:34	1:24	1:17
Range		<i>NM</i>	164	157	151	148	143	139
		<i>km</i>	303	291	279	275	265	258
<b>Endurance and Range at 15 liters (3.96 US gal)</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	71	70
		<i>km</i>	152	145	140	137	132	129

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>l/h</i>	12.9	14.9	17.2	18.7	21.1	22.8	
	<i>US gal/h</i>	3.41	3.94	4.54	4.94	5.57	6.02	
Airspeed	IAS	<i>knot</i>	65	74	83	89	97	103
		<i>km/h</i>	120	137	154	165	180	191
	CAS	<i>knot</i>	66	74	82	87	95	100
		<i>km/h</i>	122	137	152	161	176	185
	TAS	<i>knot</i>	71	79	87	93	101	107
		<i>km/h</i>	131	146	161	172	187	198
<b>Endurance and Range at 113 liters (29.85 US gal)</b>								
Endurance	<i>hh:mm</i>	8:45	7:35	6:34	6:02	5:21	4:57	
Range	<i>NM</i>	622	599	572	562	541	530	
	<i>km</i>	1152	1110	1059	1041	1002	982	
<b>Endurance and Range at 90 liters (23.77 US gal)</b>								
Endurance	<i>hh:mm</i>	6:58	6:02	5:13	4:48	4:15	3:56	
Range	<i>NM</i>	495	477	455	448	431	422	
	<i>km</i>	917	884	843	829	798	782	
<b>Endurance and Range at 60 liters (15.85 US gal)</b>								
Endurance	<i>hh:mm</i>	4:39	4:01	3:29	3:12	2:50	2:37	
Range	<i>NM</i>	330	318	303	298	287	282	
	<i>km</i>	612	589	562	553	532	521	
<b>Endurance and Range at 30 liters (7.92 US gal)</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>km</i>	306	295	281	276	266	261	
<b>Endurance and Range at 15 liters (3.96 US gal)</b>								
Endurance	<i>hh:mm</i>	1:09	1:00	0:52	0:48	0:42	0:39	
Range	<i>NM</i>	83	80	76	75	72	70	
	<i>km</i>	153	147	141	138	133	130	



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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>l/h</i>	12.5	14.6	16.8	18.4	20.8	22.3
		<i>US gal/h</i>	3.30	3.86	4.44	4.86	5.49	5.89
Airspeed	IAS	<i>knot</i>	62	69	79	84	92	98
		<i>km/h</i>	115	128	146	156	170	181
	CAS	<i>knot</i>	63	70	78	83	90	95
		<i>km/h</i>	117	130	144	154	167	176
	TAS	<i>knot</i>	69	77	85	91	99	105
		<i>km/h</i>	128	143	157	169	183	194
<b>Endurance and Range at 113 liters (29.85 US gal)</b>								
Endurance		<i>hh:mm</i>	9:02	7:44	6:43	6:08	5:25	5:04
Range		<i>NM</i>	624	596	572	559	538	532
		<i>km</i>	1155	1104	1059	1035	996	985
<b>Endurance and Range at 90 liters (23.77 US gal)</b>								
Endurance		<i>hh:mm</i>	7:12	6:09	5:21	4:53	4:19	4:02
Range		<i>NM</i>	497	475	455	445	428	424
		<i>km</i>	920	879	843	824	793	785
<b>Endurance and Range at 60 liters (15.85 US gal)</b>								
Endurance		<i>hh:mm</i>	4:48	4:06	3:34	3:15	2:53	2:41
Range		<i>NM</i>	331	316	304	297	286	283
		<i>km</i>	613	586	562	550	529	523
<b>Endurance and Range at 30 liters (7.92 US gal)</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>km</i>	307	293	281	275	264	262
<b>Endurance and Range at 15 liters (3.96 US gal)</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>km</i>	153	147	141	137	132	131

Altitude		ft	9,000					
Engine speed	rpm		4,200	4,500	4,800	5,000	5,300	5,500
Fuel consumption	l/h		12.2	14.3	16.4	18.0	20.4	21.8
	US gal/h		3.22	3.78	4.33	4.76	5.39	5.76
Airspeed	IAS	knot	57	64	73	79	86	92
		km/h	106	119	135	146	159	170
	CAS	knot	59	65	73	78	85	90
		km/h	109	120	135	144	157	167
	TAS	knot	67	74	83	89	97	103
		km/h	124	137	154	165	180	191
<b>Endurance and Range at 113 liters (29.85 US gal)</b>								
Endurance	hh:mm		9:15	7:54	6:53	6:16	5:32	5:11
Range	NM		621	585	572	559	537	534
	km		1149	1083	1059	1035	995	989
<b>Endurance and Range at 90 liters (23.77 US gal)</b>								
Endurance	hh:mm		7:22	6:17	5:29	5:00	4:24	4:07
Range	NM		494	466	455	445	428	425
	km		915	863	844	824	793	788
<b>Endurance and Range at 60 liters (15.85 US gal)</b>								
Endurance	hh:mm		4:55	4:11	3:39	3:20	2:56	2:45
Range	NM		330	310	304	297	285	283
	km		610	575	562	549	528	525
<b>Endurance and Range at 30 liters (7.92 US gal)</b>								
Endurance	hh:mm		2:27	2:05	1:49	1:40	1:28	1:22
Range	NM		165	155	152	148	143	142
	km		305	288	281	275	264	263
<b>Endurance and Range at 15 liters (3.96 US gal)</b>								
Endurance	hh:mm		1:13	1:02	0:54	0:50	0:44	0:41
Range	NM		82	78	76	74	71	71
	km		153	144	141	137	132	131



### 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

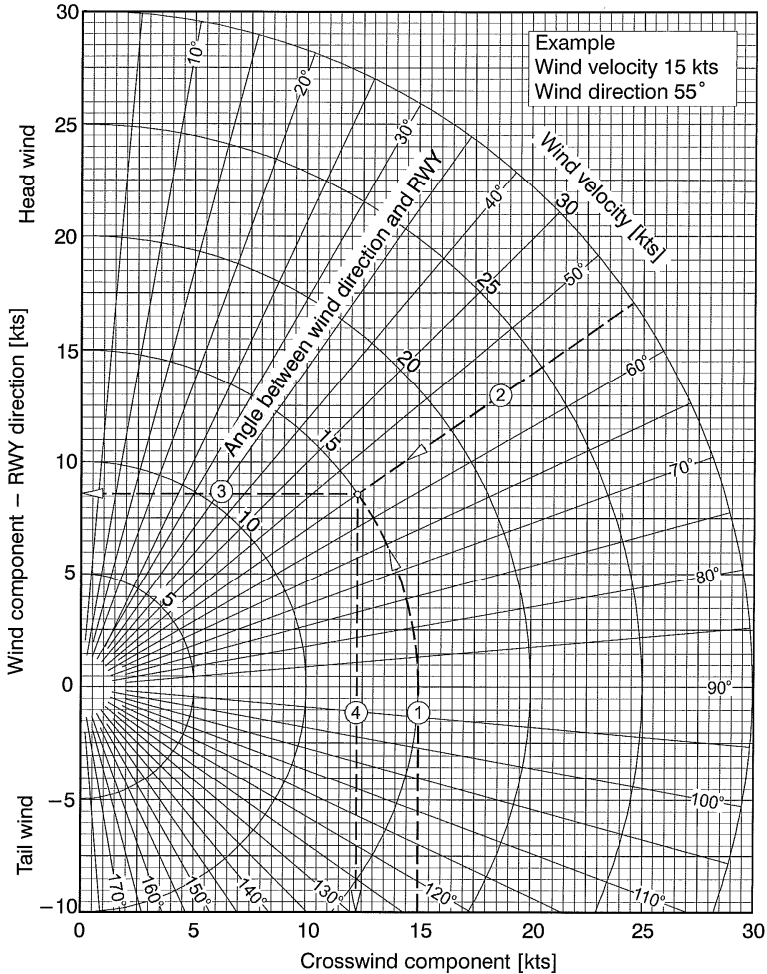
IAS	CAS
<i>km/h</i>	
55	64
60	68
70	77
80	86
90	95
100	104
110	113
120	122
130	131
140	140
150	149
160	158
170	167
180	176
190	185
200	194
210	203
220	212
230	221
240	230
250	239
255	243

### 5.6 Demonstrated wind performance

Max. demonstrated headwind velocity for take-off and landing: 24 [knot] (13 [m/s])

Max. demonstrated crosswind velocity for take-off and landing: 12 [knot] (6,5 [m/s])

#### 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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### 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 50 [°C] (122 [°F]). 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 120 [rpm].

### NOTE

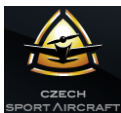
Only one magneto should be switched on (off) during ignition magneto check.

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] (11 [m/s]). 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  $\pm$ 100 [rpm])
4. Instruments within limits - check
5. Brakes - release
6. Nose wheel unstuck - 32 [knot] (60 [km/h])
7. Airplane lift-off - 42 [knot] (78 [km/h])
8. Passing to climb - after reaching airspeed 65 [knot] (120 [km/h])
9. Wing flaps - retract at safe altitude (*max. airspeed for flaps using is 75 [knot], 139 [km/h]*)

### 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] (104 [km/h])<br>- $v_y = 62$ [knot] (115 [km/h])                      |
| 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] (104 [km/h])

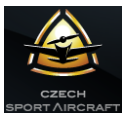
**7.5.2 Best rate of climb speed( $v_y$ ):** 62 [knot] (115 [km/h])

## 7.6 Cruise

Refer to Section 5, for recommended cruising figures

## 7.7 Descend

Optimum glide speed - 60 [knot] (110 [km/h])



### 7.8 Approach

- |                |                          |
|----------------|--------------------------|
| Approach speed | - 60 [knot] (110 [km/h]) |
| 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] (110-139 [km/h]) and check that the engine instruments indicate values within permitted limits.*

### 7.9 Normal landing

#### 7.9.1 Before landing

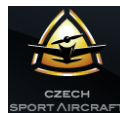
- |               |                          |
|---------------|--------------------------|
| 1. Throttle   | - as necessary           |
| 2. Airspeed   | - 60 [knot] (110 [km/h]) |
| 3. Wing flaps | - extend as necessary    |
| 4. Trim       | - as necessary           |

#### 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] (120 [km/h])                                                       |
| 3. Trim                  | - adjust as necessary                                                                         |
| 4. Wing flaps            | - retract at safe altitude<br>(max. airspeed for flaps using is<br>75 [knot], 139 [km/h])     |
| 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.*