DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

G23CE
Revision 5
Stemme AG
TSA-M
Models S6, S6-RT
February 12, 2015

TYPE CERTIFICATE DATA SHEET NO. G23CE

This data sheet, which is part of Type Certificate No. G23CE prescribes conditions and limitations under which the product for which the Type Certificate was issued meets the airworthiness requirements of the Federal Aviation Regulations.

Type Certificate Holder: Stemme AG
Flugplatzstraße F2, Nr. 6 - 7
D-15344 Strausberg, Germany

Type Certificate Holder Record: Stemme GmbH & Co. KG transferred TC G23CE to Stemme AG on August 11, 2014.

I. TSA-M Model S6, Self-Launching Motor Glider, Utility Category, approved April 5, 2011

Description. The Stemme TSA-M S6 is a two-seat (side-by-side), self-launching, all composite sailplane with a T-tail configuration and 18 meter wingspan. It is equipped with a Rotax model 914-F2 four stroke engine and a variable pitch, constant speed, multi-blade propeller. The engine is mounted in the center fuselage and utilizes a propeller shaft system. The glider has winglets, a fixed landing gear, and uses Schempp-Hirth type airbrakes on the upper wing surface. It is certificated under Certifcation Specifications for Sailplanes and Powered Sailplanes (CS-22) by the European Aviation Safety Agency (EASA) to operate in the Utility category under EASA Type Certificate Data Sheet (TCDS) number A.143, Issue 04, dated July 01, 2011.

Engine. (1) Rotax 914 F2; EASA TCDS No. E.122, Issue 3, dated February 26, 2010

Fuel. MOGAS
U.S. Standard: ASTM D4814
AVGAS (unleaded gasoline according to EN 228, min. RON 95); otherwise AVGAS 100LL.

Oil (lubrication). Regular automotive oils with additives for gears. Do NOT use alloyed or un-alloyed aircraft engine oil. If AVGAS is used, do NOT use fully synthetic oil. See Maintenance Manual.

Coolant. Minimum: 0.63 U.S. gal/2.4 liters; Maximum: 0.66 U.S. gal/2.5 liters. See Flight Manual.

Engine Limits.

Max. Take off power (max. 5 min):	115 HP (84.5 kW) at 5800 rpm
Max. Continuous Power at MSL:	100 HP (73.5 kW) at 5500 rpm
Max. Cylinder Head Temperature:	Minimum: 122° F (50° C)
	Maximum: 275° F (135° C)

Propeller. Muhlbauer Model MTV-7-A/170/051 with Constant Speed Control Unit
Control Unit: P120-A
German civil aviation authority, the Luftfahrt-Bundesamt (LBA) TCDS No. 32.130/84 R.3
Diameter: 5.58 ft (1700 mm), 3-blade,No further diameter reduction permitted

Airspeed Limits (IAS). Please check the Flight Manual.

V_{NE} Speed Limit versus Altitude	[knots]	[mph]	[km/h]
0 - 1000 m (3281 ft)	145	168	270
2000 m (6562 ft)	145	168	270
3000 m (9843 ft)	138	159	255
4000 m (13,123 ft)	132	152	245
5000 m (16,404 ft)	124	143	230
6000 m (19,685 ft)	119	137	220
8000 m (26,247 ft)	105	121	195
10,000 m (32,808 ft)	92	106	170
12,000 m (39,370 ft)	81	93	150

	[knots]	[mph]	[km/h]
V_A (Maneuvering Speed)	102	117	190
V_{RA} (Rough Air)	102	117	190
V_{FE} (Max Flap Operating Speed)			
- Flap setting: Cruise, Neutral	145	168	270
- Flap setting: TO/LDG 1	102	117	190
- Flap setting: LDG 2	75	86	140

Airspeed Indicator Speed Markings.

Marking	IAS(Value/Range
White Arc	45 to 102 kts / 85 to 190 km/h
Green Arc	52 to 102 kts / 96 to 190 km/h
Yellow Arc	102 to 145 kts / 190 to 270 km/h
Red Line	145 kts / 270 km/h
Blue Line	62 kts / 115 km/h
Yellow Triangle	60 kts / 110 km/h
White Triangle to the outside and Letter “L”	75 kts / 140 km/h

C.G. Range. Max. Forward C.G position: 8.82 in. (224 mm) aft of datum
Max. Aft C.G position: 16.10 in. (409 mm) aft of datum

Datum. Wing leading edge of the inner wing at wing root rib. See Flight Manual.

Leveling Means. Tail jacked up such that the upper edge of a wedge with slope 1000:42 (2.4 degrees) is horizontal when placed on rear top of fuselage.

Maximum Weights. Max. Take-Off: 1874 lbs (850 kg)
Max. Landing: 1874 lbs (850 kg)
Max. Payload in Rear Baggage Compartment: 44 lbs (20 kg)

Minimum Crew. One (pilot). If the aircraft has an additional airspeed indicator and wheel brake on the right-hand side, it may be flown from the left seat or the right seat.

No. of Seats. Two
Moment arm 17.6 in (447 mm) forward of datum

Tow Release. None. Aerotow, autotow, and winch launching not authorized

Fuel Capacity.

One standard tank (located on right side): 17.2 U.S. gal (65 liters)
- Useable fuel: 16.65 U.S. gal (62.9 liters)
- Non-useable fuel: 0.55 U.S. gal (2.1 liters)

Option to install integral tank in left wing:
- Tank capacity: 17.2 U.S. gal (65 liters)
- Useable fuel: 16.91 U.S. gal (64 liters)
- Non-useable fuel (left): 0.3 U.S. gal (1 liter)

Moment arm: 4.4 in (111.8 mm) aft of datum

Oil Capacity.

Max. 0.8 U.S. gal (3.0 liters)
Min. 0.5 U.S. gal (2.0 liters)
Moment arm: 43.3 in (1100) mm aft of datum

Maximum Operating Altitude.

16,000 ft (4875 meters) MSL with engine running. At higher altitudes, an unproblematic restart of the engine cannot be guaranteed.

Water Ballast.

None

Control Surface Movements.

Ailerons:

Up travel (outboard):	(-) 21° ± 2°
Down travel (outboard):	(+) 10.5° ± 2°
Neutral position:	0° ± 2°
Up travel (inboard):	(-) 10.5° ± 2°
Down travel (inboard):	(+) 5.3° ± 2°

Flaps:

Flap setting (Ground, LH, RH):	
Cruise:	(-) 4.0° ± 1°
Neutral:	(+) 5.0° ± 1°
Takeoff / Landing I:	(+) 18.5° ± 1°
Landing II:	(+) 25° ± 1°

Horizontal Stabilizer and Elevator:

Up travel:	(-) 25° ± 0° (Adjustment by stops)
Down travel:	(+) 25° ± 0° (Adjustment by stops)

Vertical Stabilizer and Rudder:

Travel:	(±) 35° ± 0° (Adjustment by stops)

Battery.

Engine Compartment: 12V / 16-40 Ah
See Flight Manual for additional information

Serial Nos. Eligible.

Serial numbers 013 and subsequent.

Certification Basis.

The regulations (unless otherwise stated) are Title 14 of the Code of Federal Regulations (14CFR):

1) FAR Part 21 effective February 1, 1965 including Amendment 21-1 through 21-86;

2) Certification Specifications for Sailplanes and Powered Sailplanes (CS-22), Issued November 14, 2003.

3) Preliminary Standard for the Substantiation of Indirect Drive Shafts in Power Plants of Powered Sailplanes (JAR 22) with modifications for S 10), dated August 05, 1988.

4) LBA Standards for Structural Substantiation of Sailplanes and Powered Sailplane Parts Consisting of Glass or Carbon Fibre Reinforced Plastics, issued July 1991.

Certification Basis, cont'd.

5) Guideline for the analysis of the electrical system for powered sailplanes, I334-MS 92, issued September 15, 1992.

6) First-time defined by LBA-Letter M314-846/02/01 and upgraded to EASA Certification Standard with letter dated November 16, 2005.

7) EASA Type Certificate No. EASA.A.143, Issue 3, dated July 08, 2010.

Production Basis.

Stemme AG
Flugplatzstraße F2, Nr. 6 - 7
D-15344 Strausberg, Germany
EASA Production Organization Approval Number: DE.21G.0068

Import Requirements.

The FAA can issue a U.S. airworthiness certificate based on the German civil airworthiness authority, the Luftfahrt-Bundesamt (LBA), Export Certificate of Airworthiness (Export C of A) signed by a representative of the LBA on behalf of the European Community. The Export C of A should contain the following statement: "The aircraft covered by this certificate has been examined, tested, and found to conform to the type design approved under FAA Type Certificate G23CE and to be in a condition for safe operation."

Stemme Technical Note Document Number P280-901.427, Issue 01.a, titled "Heat Protection Pitot Tubing Mid Fuselage" must be incorporated.

Equipment.

Minimum equipment and instruments (Day VFR operations only):

(1) Airspeed Indicator with range 0 - 200 kts or 0 - 350 km/h
(1) Altimeter with range 0 - 20,0000 ft or 0 - 30,000 ft
(1) Magnetic Compass
(1) Electric Trim Indicator
(1) Fuel Gauge for each tank
(1) Oil Temperature Gauge
(1) Fuel Pressure Warning Light
(1) Oil Pressure Gauge
(1) Cylinder Head Temperature Gauge for each engine side
(1) Manifold Air Pressure (MAP) Gauge
(1) Ampere Meter
(1) Voltmeter
(1) Tachometer
(1) Generator Caution Light
(1) Engine Hour Meter
(2) Four-point Safety Harness (symmetrical)
(1) Stall Warning Indicator
(1) Fire Warning Indicator
(1) Pitot/Static pressure probe
(1) Dataplate and Trim sheet, Cockpit Placards, Flight Manual
(1) Gap sealing on each side of the vertical tail
(2) Automatic or Manual Parachute or Back Cushion when flying without a parachute
(1) FAA-approved Flight Manual for Stemme TSA-M, model S6

Refer to the Flight and Maintenance Manual for additional equipment.

Service Information.

Each of the documents listed below must state that it is approved by the European Aviation Safety Agency (EASA) or – for approvals made before September 28, 2003 – by the German civil airworthiness authority (LBA).

- Service bulletins
- Structural repair manuals
- Vendor manuals
- Aircraft flight manuals
- Overhaul and maintenance manuals

Service Information, cont'd.

The FAA accepts such documents and considers them FAA-approved for type design data unless one of the following conditions exist:

- The documents change the limitations, performance, or procedures of the FAA approved manuals.

The FAA uses the post type validation procedures to approve these documents. The FAA may delegate case-by-case approval to EASA on behalf of the FAA for the U.S. type certificate. If this is the case it will be noted on the document.

Operating and Service Instructions.

No.	Manual No./ Part No.	Manual Title	Vendor
1	Doc. No. P400-006.000 FAA, latest revision	Airplane Flight Manual TSA-M S6	Stemme AG
2	Doc. No. P500-006.000, latest revision	Airplane Maintenance Manual TSA-M S6, S6-RT	Stemme AG
3	Rotax Part No. 809606, Rev. 1, September 01, 2007 or latest revision	Maintenance Manual (Line) for Rotax 914 series	Rotax Aircraft Engines
4	Rotax Part No. 809603, Rev. 1, January 01, 2008 or latest revision	Maintenance Manual (Heavy) for Rotax 912 and 914 series	Rotax Aircraft Engines
5	Rotax Part No. 899470, Rev. 0, December 01, 2007 or latest revision	Illustrated Parts Catalog Rotax 912 A/F/S/UL/ULS/ULSFR and 914 F/UL	Rotax Aircraft Engines
6	Rotax Part No. 899643, Rev. 1, February 01, 2008 or latest revision	Operator's Manual for Rotax 914 series	Rotax Aircraft Engines
7	E-118, Issue No. 33, September 18, 2007 or latest revision	Operation & Installation Manual, Electrically Controlled Variable Pitch Propeller	mt-Propeller Entwicklung GmbH

II. TSA-M Model S6-RT, Self-Launching Motor Glider, Utility Category, approved August 23, 2012

Description.

The Stemme TSA-M S6-RT is a two-seat (side-by-side), self-launching, retractable tricycle land gear, all composite sailplane with a T-tail configuration and 18 meter wingspan. It is equipped with a Rotax model 914-F2 four stroke engine and a variable pitch, constant speed, multi-blade propeller. The engine is mounted in the center fuselage and utilizes a propeller shaft system. The glider has winglets, a retractable landing gear, and uses Schempp-Hirth type airbrakes on the upper wing surface. It is certificated under Certification Specifications for Sailplanes and Powered Sailplanes (CS-22) by the European Aviation Safety Agency (EASA) to operate in the utility category under EASA Type Certificate Data Sheet (TCDS) number A.143, Issue 05, dated April 16, 2012.

Engine.

(1) Rotax 914 F2; EASA TCDS No. E.122, Issue 3, dated February 26, 2010

Fuel.

MOGAS
U.S. Standard: ASTM D4814
AVGAS (unleaded gasoline according to EN 228, min. RON 95); otherwise AVGAS 100LL.

Oil (lubrication).

Regular automotive oils with additives for gears. Do NOT use alloyed or un-alloyed aircraft engine oil. If AVGAS is used, do NOT use fully synthetic oil. See Maintenance Manual.

Coolant.

Minimum: 0.63 U.S. gal/2.4 liters; Maximum: 0.66 U.S. gal/2.5 liters. See Flight Manual.

Engine Limits.

Max. Take off power (max. 5 min):	115 HP (84.5 kW) at 5800 rpm
Max. Continuous Power at MSL:	100 HP (73.5 kW) at 5500 rpm
Max. Cylinder Head Temperature:	Minimum: 122° F (50° C) Maximum: 275° F (135° C)

Propeller. Muhlbauer Model MTV-7-A/170/051 with Constant Speed Control Unit
Control Unit: P120-A
German civil aviation authority, the Luftfahrt-Bundesamt (LBA) TCDS No. 32.130/84 R.3
Diameter: 5.58 ft (1700 mm), 3-blade,No further diameter reduction permitted

Airspeed Limits (IAS). See Flight Manual

	[knots]	[km/h]
V_{NE} Varies with Altitieu-See Flight Manual	145	270
V_A (Maneuvering Speed)	102	190
V_{RA} (Rough Air)	102	190
V_{FE} (Max Flap Operating Speed)		
- Flap setting: Cruise, Neutral	145	270
- Flap setting: TO/LDG 1	102	190
- Flap setting: LDG 2	75	140
V_{LO} (Landing Gear extended)	75	140

Airspeed Indicator Speed Markings.

Marking	IAS(Value/Range
White Arc	47 to 102 kts / 85 to 190 km/h
Green Arc	53 to 102 kts / 98 to 190 km/h
Yellow Arc	102 to 145 kts / 190 to 270 km/h
Red Line	145 kts / 270 km/h
Blue Line	68 kts / 125 km/h
Yellow Triangle	60 kts / 110 km/h
White Triangle to the outside and Letter “L”	75 kts / 140 km/h

C.G. Range. Max. Forward C.G position: 8.82 in. (224 mm) aft of datum
Max. Aft C.G position: 16.10 in. (409 mm) aft of datum

Datum. Wing leading edge of the inner wing at wing root rib. See Flight Manual.

Leveling Means. Tail jacked up such that the upper edge of a wedge with slope 1000:42 (2.4 degrees) is horizontal when placed on rear top of fuselage.

Maximum Weights. Max. Take-Off: 1984 lbs (900 kg)
Max. Landing: 1984 lbs (900 kg)
Max. Payload in Rear Baggage Compartment: 44 lbs (20 kg)

Minimum Crew. One (pilot). If the aircraft has an additional airspeed indicator and wheel brake on the right-hand side, it may be flown from the left seat or the right seat.

No. of Seats. Two
Moment arm 17.6 in (447 mm) forward of datum

Tow Release. None. Aerotow, autotow, and winch launching not authorized

Fuel Capacity.

One standard tank (located on right side): 17.2 U.S. gal (65 liters)
- Useable fuel: 16.65 U.S. gal (62.9 liters)
- Non-useable fuel: 0.55 U.S. gal (2.1 liters)

Option to install integral tank in left wing:
- Tank capacity: 17.2 U.S. gal (65 liters)
- Useable fuel: 16.91 U.S. gal (64 liters)
- Non-useable fuel (left): 0.3 U.S. gal (1 liter)

Moment arm: 4.4 in (111.8 mm) aft of datum

Oil Capacity.

Max. 0.8 U.S. gal (3.0 liters)
Min. 0.5 U.S. gal (2.0 liters)
Moment arm: 43.3 in (1100) mm aft of datum

Maximum Operating Altitude.

16,000 ft (4875 meters) MSL with engine running. At higher altitudes, an unproblematic restart of the engine cannot be guaranteed.

Water Ballast.

None

Control Surface Movements.

Ailerons:

Up travel (outboard):	(-) 21° ± 2°
Down travel (outboard):	(+) 10.5° ± 2°
Neutral position:	0° ± 2°
Up travel (inboard):	(-) 10.5° ± 2°
Down travel (inboard):	(+) 5.3° ± 2°

Flaps:

Flap setting (Ground, LH, RH):	
Cruise:	(-) 4.0° ± 1°
Neutral:	(+) 5.0° ± 1°
Takeoff / Landing I:	(+) 18.5° ± 1°
Landing II:	(+) 25° ± 1°

Horizontal Stabilizer and Elevator:

Up travel:	(-) 25° ± 0° (Adjustment by stops)
Down travel:	(+) 25° ± 0° (Adjustment by stops)

Vertical Stabilizer and Rudder:

Travel:	(±) 35° ± 0° (Adjustment by stops)

Battery.

Engine Compartment: 12V / 16-40 Ah
See Flight Manual for additional information

Serial Nos. Eligible.

Serial numbers 016 and subsequent.

Certification Basis.

The regulations (unless otherwise stated) are Title 14 of the Code of FederalRegulations (14CFR):

1) FAR Part 21 effective February 1, 1965 including Amendment 21-1 through 21-86;

2) Certification Specifications for Sailplanes and Powered Sailplanes (CS-22), Issued November 14, 2003.

3) Preliminary Standard for the Substantiation of Indirect Drive Shafts in Power Plants of Powered Sailplanes (JAR 22) with modifications for S 10, dated August 05, 1988.

4) LBA Standards for Structural Substantiation of Sailplanes and Powered Sailplane Parts Consisting of Glass or Carbon Fibre Reinforced Plastics, issued July 1991.

5) Guideline for the analysis of the electrical system for powered sailplanes, I334-MS 92, issued September 15, 1992.

Certification Basis, cont'd.

6) First-time defined by LBA-Letter M314-846/02/01 and upgraded to EASA Certification Standard with letter dated November 16, 2005.

7) EASA Special Condition SC-A22.1.01 – "Increase in maximum mass for sailplanes and powered sailplanes"

8) EASA Equivalent Safety Finding: CS-VLA 725, CS-VLA 726, CS-VLA 727: Drop test retractable landing gear

9) EASA Equivalent Safety Finding: CS-23.1435: Hydraulic system

10) EASA Type Certificate No. EASA.A.143, Issue 5, dated March 29, 2012.

Production Basis.

Stemme AG
Flugplatzstraße F2, Nr. 6 - 7
D-15344 Strausberg, Germany
EASA Production Organization Approval Number: DE.21G.0068

Manufacturer Historical Record:
Stemme AG
Flugplatzstraße F2, Nr. 7
D-15344 Strausberg, Germany

Import Requirements.

The FAA can issue a U.S. airworthiness certificate based on the German civil airworthiness authority, the Luftfahrt-Bundesamt (LBA), Export Certificate of Airworthiness (Export C of A) signed by a representative of the LBA on behalf of the European Community. The Export C of A should contain the following statement: "The aircraft covered by this certificate has been examined, tested, and found to conform to the type design approved under FAA Type Certificate G23CE and to be in a condition for safe operation."

Stemme Technical Note Document Number P280-901.427, Issue 01.a, titled "Heat Protection Pitot Tubing Mid Fuselage" must be incorporated.

Equipment.

Minimum equipment and instruments (Day VFR operations only):

(1) Airspeed Indicator with range 0 - 200 kts or 0 - 350 km/h
(1) Altimeter with range 0 - 20,0000 ft or 0 - 30,000 ft
(1) Magnetic Compass
(1) Electric Trim Indicator
(1) Fuel Gauge for each tank
(1) Oil Temperature Gauge
(1) Fuel Pressure Warning Light
(1) Oil Pressure Gauge
(1) Cylinder Head Temperature Gauge for each engine side
(1) Manifold Air Pressure (MAP) Gauge
(1) Ampere Meter
(1) Voltmeter
(1) Tachometer
(1) Generator Caution Light
(1) Engine Hour Meter
(2) Four-point Safety Harness (symmetrical)
(1) Stall Warning Indicator
(1) Fire Warning Indicator
(1) Indicator Lights for Retractable Landing Gear
(1) Landing Gear Warning
(1) Pitot/Static pressure probe
(1) Dataplate and Trim sheet, Cockpit Placards, Flight Manual
(1) Gap sealing on each side of the vertical tail
(2) Automatic or Manual Parachute or Back Cushion when flying without a parachute
(1) FAA-approved Flight Manual for Stemme TSA-M, model S6-RT

Equipment, cont'd.

Refer to the Flight and Maintenance Manual for additional equipment.

Service Information.

Each of the documents listed below must state that it is approved by the European Aviation Safety Agency (EASA) or – for approvals made before September 28, 2003 – by the German Airworthiness Authority (LBA).

- Service bulletins
- Structural repair manuals
- Vendor manuals
- Aircraft flight manuals
- Overhaul and maintenance manuals

The FAA accepts such documents and considers them FAA-approved for type design data unless one of the following conditions exist:

- The documents change the limitations, performance, or procedures of the FAA approved manuals.

The FAA uses the post type validation procedures to approve these documents. The FAA may delegate case-by-case approval to EASA on behalf of the FAA for the U.S. type certificate. If this is the case it will be noted on the document.

Operating and Service Instructions.

No.	Manual No./ Part No.	Manual Title	Vendor
1	Doc. No. P400-006.001 FAA, latest revision	Airplane Flight Manual TSA-M S6-RT	Stemme AG
2	Doc. No. P500-006.000, latest revision	Airplane Maintenance Manual TSA-M S6, S6-RT	Stemme AG
3	Rotax Part No. 809606, Rev. 1, September 01, 2007 or latest revision	Maintenance Manual (Line) for Rotax 914 series	Rotax Aircraft Engines
4	Rotax Part No. 809603, Rev. 1, January 01, 2008 or latest revision	Maintenance Manual (Heavy) for Rotax 912 and 914 series	Rotax Aircraft Engines
5	Rotax Part No. 899470, Rev. 0, December 01, 2007 or latest revision	Illustrated Parts Catalog Rotax 912 A/F/S/UL/ULS/ULSFR and 914 F/UL	Rotax Aircraft Engines
6	Rotax Part No. 899643, Rev. 1, February 01, 2008 or latest revision	Operator's Manual for Rotax 914 series	Rotax Aircraft Engines
7	E-118, Issue No. 33, September 18, 2007 or latest revision	Operation & Installation Manual, Electrically Controlled Variable Pitch Propeller	mt-Propeller Entwicklung GmbH

NOTES For Both TSA-M Models S6 and S6-RT.

NOTE 1. Current weight and balance data including list of equipment included in the certificated empty weight and loading instructions, when necessary, must be provided for each glider at the time of original certification and at all times thereafter.

NOTE 2. Operation approved only for VFR. Aerobatics and cloud flying are not permitted.

NOTE 3. The placards listed in the flight and maintenance manuals must be displayed per the maintenance manual requirements.

NOTE 4. Airworthiness Limitations are specified in the Limitation section of the Flight Manual, are FAA-approved, and may not be changed without FAA approval.

NOTE 5. All parts of the airframe, exposed to sun radiation, except the areas for markings and registration as specified by the manufacturer, must have a white color surface.

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