

EASA
certified
2008

STEMME

special news - S6 certified

STEMME S6 certified

On October 22nd the EASA drew up the type certification for the STEMME S6 – the yield of several years of complex development work.

With this important step STEMME opens a new class in general aviation – a motorglider fulfilling the demands for modern powered flight and good soaring capabilities. Its design is innovative, robust and reliable giving the S6 a capacity for excellent performance but making it also fuel efficient and quiet in operation. In that regard the plane follows in a straight line the legendary STEMME S10, which in itself is setting new standards for a while now. Those pilots who think the S10 is an aircraft too special for them but don't want to abdicate STEMME design and quality, will feel comfortable in the S6 from the start.

Learn more by reading the flight report of Uli Schell, one of the first pilots outside our company allowed to fly the S6:

Stemme S6 Motorglider Flight Test Report

Ground Operation

Taxiing is precise - nose wheel steering makes it easy to follow the standard yellow taxi lines at Strausberg airport. This is achieved by virtue of an unconventionally large distance between nose wheel and main wheels, resulting in perfect nose wheel steering.

The rugged landing gear provides solid support for the airframe, and a track wider than what is typically found in motorgliders helps to make the pilot forget that the wing extends to a span of 18 meters! The central brake (disk) is easy to use, and it is very effective.

Run-up procedures are conventional. All functions, i.e. propeller setting, magneto check, elevator trim setting, checking of controls, trailing wing flap positioning for takeoff, locking of air brakes, avionics, etc. work flawlessly.

Takeoff and Climb

The brakes are strong enough to hold the airplane in position all the way up to a maximum engine output of 115 hp, acceleration during the takeoff run is very quick, and, in spite of crosswind conditions, the motorglider tracks in a straight line

all the way to rotational speed.

A slight pull on the stick is all that is required for the fully loaded airplane to climb out of the pattern at better than 1000 ft/min.

Soon the wing flaps are set to the 'neutral' position, engine performance is reduced to 'max continuous', and a swift climb is made to FL 100.

After the elevator trim is set for straight and level, further flight feels almost like it were conducted on autopilot, the airplane is stable, yet this stability can easily be overpowered.





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Cruise

At 4000 ft under standard atmospheric conditions the S6 (fixed gear) actually does reach a top speed of 225 km/h indicated (TAS 250 km/h) at maximum continuous RPM. This is achieved with trailing edge flaps in negative setting, further reducing susceptibility to wind gusts. Forward visibility is slightly reduced in this attitude, but it is sufficient. Getting closer to VFR minimum conditions, it may be better to leave the wing flaps in the neutral position, with a reduction in airspeed in the 5-10 km/h range. The engine surprisingly runs velvety smooth and without perceived vibration when the S6 is flying at airspeeds between 140 to 200 km/h. This can be achieved by reducing propeller RPM.

Soaring

This touring motorglider (TMG) is certificated according to motorglider specification, meaning the maximum gross weight is limited to 850 kilograms, and maximum allowable sink rate is 1.2 meters per second at full gross weight under standard atmospheric conditions. The S6 easily meets this requirement with a sink rate of 1.0 meters per second. Entry into turns can be coordinated well, and visibility is excellent.

Flight near limit conditions

Depending on center of gravity (CG) location, controllability for stall entry can be verified, and aerodynamic buffeting and 'softening' of the ailerons provide clear warning. Stall recovery is conventional, the S6 responds immediately and predictably.

Spins can be entered more or less well with CG locations at center or aft positions, recovery is without problems, full rudder opposite to the direction of spin being the only control input of importance.

Full recovery is achieved within one full turn.

There is little response to deviation from correct control movement (errors) with respect to aileron or elevator input, the only important control input being rudder opposite to the direction of spin.

Spiral dives are clearly different from spins, especially with respect to higher control forces 'inviting' pilots to relax their control input.

Higher forward speeds can clearly be felt as an increase in control forces. In addition to the limitations shown on the airspeed indicator, there is sufficient indication of airspeed via pitch attitude. Thus, the certification requirement for an indication of high limit airspeeds independent of a faulty or in-operational airspeed indicator is met. To accommodate cases of total loss of control irrespective of cause, safe deployment of air brakes has been verified up to V_{ne} . The effectiveness of air brakes is impressive, as it is impossible to exceed V_{ne} even when the dive is almost vertical.

Landing

Approaches can be flown like a glider, i.e. with the engine secured/idle, trailing edge flaps in fixed position, and coordinated use of air brakes; or they can be flown with partially deple-



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yed, fixed position airbrakes and variations of engine power.

The well-balanced tricycle landing gear makes it relatively easy to control the S6 during the flare and roll out phase. Also, the geometry of the gear should make for very forgiving characteristics in the event of rough or uncoordinated landings.

Without vertical loads the nose wheel remains centered in flight, which ensures a very high degree of directional stability even in extreme crosswinds. Rugged everyday flight operation will benefit from the S6's superior high speed taxi capability with no interference from the 18 meter wing span.

Operating the S6 as a trainer

Listing of possible missions:

1. Primary training in general
2. Specialized powered or soaring flight training, advanced training
 - mountain check-outs,
 - stall and spin training,
 - high altitude training (no mountain can get in the way of the S6),
 - dives,
 - radio navigation (CVFR, i.e. Class C and B operations),
 - use of constant speed propeller,
 - operating a turbocharged power plant,
 - use of camber changing flaps,
 - use of airbrakes,
 - procedures

The above listing shows the wide range of training operations that can be performed with this motor glider. On the one hand, even beginners can be entrusted with the S6 when conditions are right, and on the other hand, advanced students can use it to perform a wide variety of advanced maneuvers. Operational characteristics with engine on or off are very similar, and the distinction between powered flight and gliding loses much of its significance.

The required operating-procedures for this kind of training give the possibility to reach a high quality pilot-level.

Operating noise levels deserve special mention. Thanks to the engine being mounted in the mid section of the fuselage, exhaust emissions are directed upwards. In combination with reduction gear drive for the propeller this makes for minimal noise footprint.

Low fuel consumption, extremely low noise levels, robustness, and the large number of possible mission profiles make for high utility of the S6 motor glider both as a personal airplane and as a trainer.

Uli Schell (test pilot)

There is nothing more to be said from our part.

If you are interested to experience the S6 yourself, please contact Dominik Goldfuss for making an appointment (+49.(0)3341.3612.15 or d.goldfuss@stemme.de).