

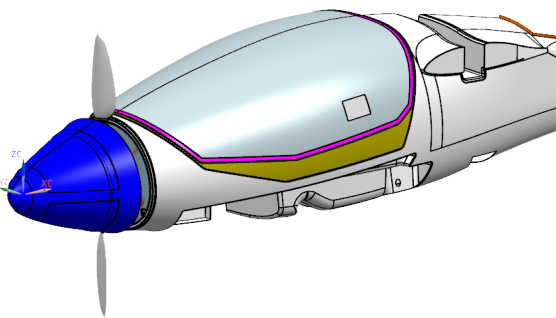
## elfin 20.e

### SPECIFICATIONS AND STANDARD EQUIPMENT LIST

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### DATA

EXTERNAL DIMENSIONS	
Wing span	65.6 ft (20 m)
Wing aspect ratio	24.7
Wing area	266 sqft (16.2 m <sup>2</sup> )
Length overall	28.5 ft (8.7 m)
Height over tail plane	5.6 ft (1.7 m)
Wheel track	3.9 ft (1.2 m)
Wheelbase	18 ft (5.5 m)
INTERNAL DIMENSIONS	
Cockpit width	4.1 ft (1.25 m)
Cockpit height	3.2 ft (0.98 m)
Cockpit entry sill height	2.8 ft (0.96 m)
WEIGHTS & LOADING	
Operating empty weight	1,190 lbs (540 kg)
MTOW	1,984 lbs (900 kg)
MTOW without water ballast	1,808 lbs (820 kg)
Max. cockpit loading	441 lbs (200 kg)
Wing loading	900–1,317 lbs/sqft (38–55.5 kg/m <sup>2</sup> )
PERFORMANCE (unpowered)	
Glide ratio L/D	50 class
PERFORMANCE (full power-pack equipped)	
Never-exceed speed V <sub>NE</sub>	151 kts (280 km/h)
Manoeuvring speed V <sub>A</sub>	108 kts (200 km/h)
Stall speed V <sub>SO</sub>	42 kts (78 km/h)
Range (elfin 20.e)	T/O to 1.640 ft (500 m) + 1h powered flight
PERFORMANCE (with RangeExtender*)	
Range (elfin 20.ex)	540 NM (1.000 km)
Cruise (elfin 20.ex) @ FL100	115 KTAS (215 km/h)

### TYPE

Side-by-side high performance electro/hybrid aircraft/glider FAI 20m two-seater class.

### PROGRAM

- Reiner Stemme established a new company to meet the challenge of **electro-hybrid powered flight** for a new class of aircraft and glider in ONE **closing the gap between two worlds of aviation**:
  - competition soaring up to long distance level
  - soaring safaris as in “Wandersegelflug” of Wolf Hirth and A-to-B travelling
- the enabling concept is Reiner Stemme’s **patented retractable propeller system and the Siemens based e-system**
  - resulting in a **fuselage with zero drag penalties** for high soaring performance,
  - long-range capability made possible by a quick-mounted hybrid **underwing pod\* with generator and integrated IC engine**.
  - steplessly adjustable power with **automated single lever propeller/power ON-OFF control** for a dynamic flight path and safe startup.

### CURRENT VERSIONS

**REINER STEMME elfin 20.e**: electric self-launch base model with one hour electric powered level flight, competition soaring performance of 1:50 glide ratio, universal tow release for winch and aerotow.\*

**REINER STEMME elfin 20.ex**: 540 NM (1000 km) touring/travel performance with underwing hybrid power pod (RangeExtender\*), quick-mount system.

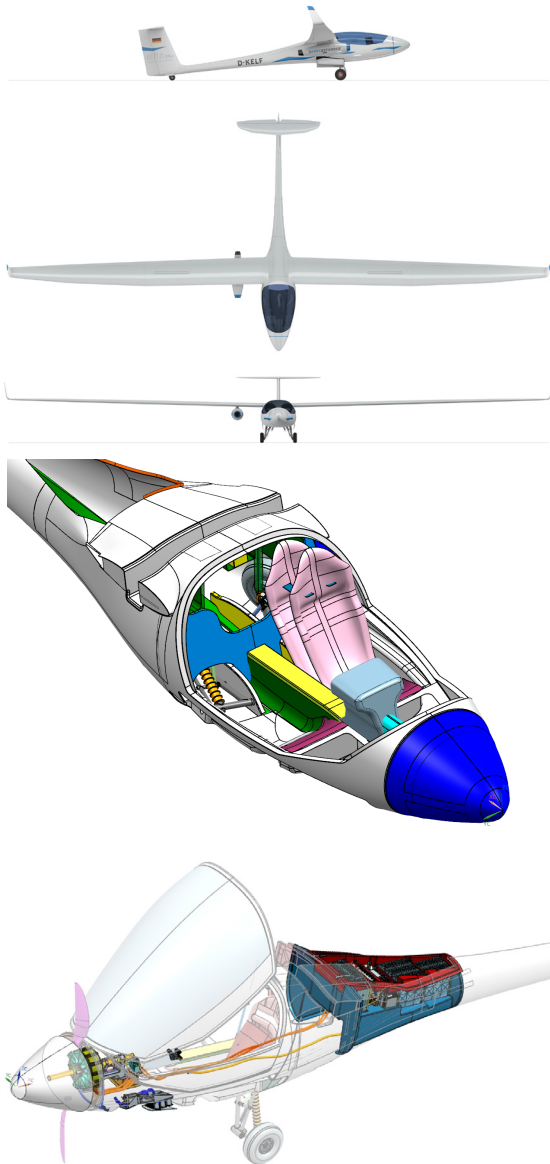
### DESIGN FEATURES

- Side-by-side cockpit in front of wing with panoramic view and low sill for easy entry
- retractable propeller system and directly coupled electric motor in fuselage nose, automatic open and close of nose cone
- main battery in rear compartment for best mass balance
- additional auxiliary battery near CG
- specific wing airfoil 20e-143 without premature lift plateau, seamlessly optimized over the entire wing span
- ambitious wing-to-fuselage intersection design with fillets for drag reduction
- turbulent root section airfoil and root twist
- outer wings foldable\* to 33 ft (9.9 m) wingspan for taxiing and hangaring
- inner wing lengthwise pivoting over fuselage for 30 x 6.5 sqft (9 m x 2 m) overall footprint

### SAFETY

The aircraft will be serially equipped with a ballistic parachute system to enhance survivability in emergencies. In addition, the seats are designed for use of individual pilot safety parachutes. The canopy can be jettisoned by a single handle (“Röger-hook” design). Additional safety features include:

- audio-visual warning system alerts for airbrake mispositioning (the source of numerous accidents)
- cockpit integrity structure complying with increased demands of EASA CS-22
- position lights integrated into airfoil; strobe\* for better visibility
- ELT system\*
- two oxygen tanks in the cockpit\*



## FLIGHT CONTROLS

- dual controls
- automatic electric flaperon control for improved flight performance
- Schempp-Hirth type airbrakes in center wing
- autopilot\*

## STRUCTURE

The entire structure is made of innovative carbon fibre prepregs to achieve considerable weight reduction which translates directly into larger power packs. The fuselage is built as a single unit, reinforced by four stringers running from the rear fuselage to the forward bulkhead. In the bottom centre of the fuselage heavy-duty stringers protect the airframe in case of a gear-up emergency landing. The fuselage shells are of sandwich design and the single spar wing in three sections is of sandwich shell design. The centre wing span runs to 9.9 m (33 ft), the outer wing mass is less than 66 lbs (30 kg). A 330 lbs (150 kg) water ballast tank and a fuel tank for the rangeExtender\* pod are included in the center wing. Comes with internal luggage compartment.

## LANDING GEAR

Electrically retractable and steerable tailwheel. Retractable main gear, also electrically actuated, independent left and right brake circuits, wheel size 5.00-5 for soft grass fields. Rubber column suspension struts for high energy absorption.

## CABIN COMFORT

Two pilots, side by side; unobstructed panoramic view; seats adjustable for position and rake for pilots between 5.3 to 6.6 ft (1.6 m and 2 m) height; forward hinged canopy with gas struts; low sill height of 38 in (96 cm) for easy entry and exit.

## PROPULSION SYSTEM

Siemens SP45D at 70 kW peak / 45 kW continuous power, mounted in aircraft nose; liquid cooling. REINER STEMME automatic actuated retractable propeller system. Power packs will be of the 2019 design, constantly benefitting from progress in the automotive industry. Battery fire protection fully complying with stringent EASA/FAA demands.

## SYSTEMS

12 V system. Electrical actuators for main landing gear and retractable tailwheel, retractable propeller system and automatic flaperon control system, lights.

## AVIONICS / INSTRUMENTATION

Basic "fly away" version (basic instruments: altitude, speed, variometer, compass, Flarm, motor management, radio, transponder) as well as customer tailored versions\*.

## MAINTENANCE

Maintenance costs of the e-powered motorglider are significantly reduced by up to 80% when compared to a conventional powered motorglider of the same class.

## GROUND HANDLING OPTIONS

Outer wing folding\* to 33 ft (9.9 m) span for taxiing and hangaring; lift-and-rotate\* inner wing 90° to lengthwise position over fuselage for storage in trailer\* or on 30 x 6.5 ft (9 m x 2 m) hangar space.

## FLIGHT OPTIONS

According to the option list.

## RANGEEXTENDER\*

IC and e-generator system for 35 kW continuous power; weight about 143 lbs (65 kg); easy one-person mounting by integrated lifting device (ground handling like pushing a trolley); fuel tank inside center wing; quick mounting in less than 5 minutes. The RangeExtender\* has negligible impact on flight mechanics and aerodynamics in powered mode, and only minor impact in glider mode.

## FLEXIBILITY OF OPERATION:

### COMPETITION

180 kg (397 lbs) water ballast and main battery only for optimized wing loading of 38 - 55.5 kg/m<sup>2</sup> (900 - 1,317 lbs/sqft); take-off either by aero-/winch-/car-tow\* or self-launch with enough battery capacity remaining to ensure airfield landing.

### BEST ALL-ROUND SOARING

Full battery capacity installed (main and auxiliary battery); take-off either by tow\* or self-launch; 1h electric flight after self-launch to 1,640 ft (500 m); up to 440 lbs (200 kg) cockpit load plus 44 lbs (20 kg) baggage.

### TOURING AND SCENIC FLYING

Main battery and RangeExtender\* installed; more than 6 hours powered flight at 100 kts, 540 NM (1,000 km) range; up to 440 lbs (200 kg) cockpit load plus 44 lbs (20 kg) baggage.

### PURE SOARING

Basic *elfin 20* is a high-performance two-seat glider and can be launched by winch-, air- or car-tow.

\* optional (for additional information or prices, please refer to the latest option list or contact us)