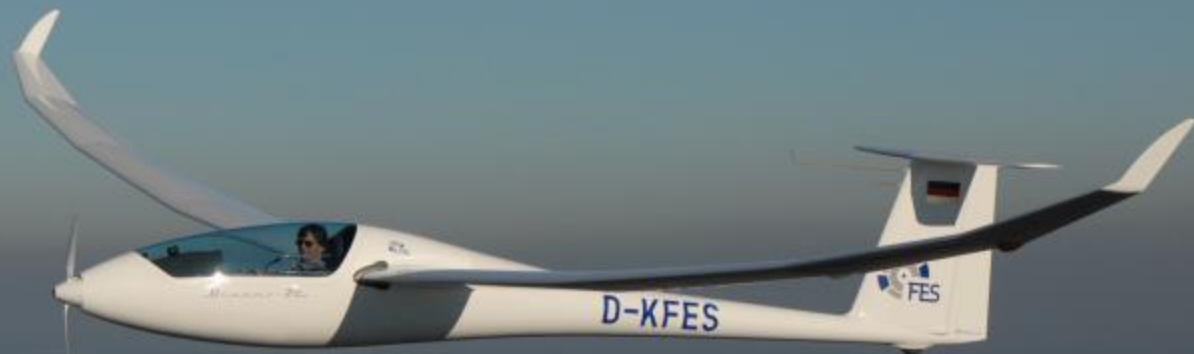




## FES

front-electric-sustainer



A well proved concept of the model construction is already in use in more than 50 units



## FES

front-electric-sustainer

Diplom Ingenieur Luka  
Znidarsic – CEO of LZ  
Design in Slovenia – has  
developed an impressively  
well engineered electrical  
sustainer system - simple  
and effective.

A concept with future





## FES

front-electric-sustainer

### Basic data of our standard FES electric motor:

- Out runner BLDC brushless synchronous permanent magnet motor with electronically controlled commutation system 3 phase
- 20kW continuous power at 118V
- Up to 23 kW for shorter time
- Rotor ring diameter 180mm
- Length 100mm
- Weight of motor is only 7,3 kg
- Efficiency up to 95%.
- Rotor position by hall sensors





## FES

front-electric-sustainer

### Batterie

Battery pack type: FES-BP-14S GEN2

Weight of single battery packs: 16 kg

Box dimensions (WxLxH), without terminals and ventilators  
154x220x257 mm

Cells producer: Kokam, South Korea

Cells type: SLPB100216216H

Average capacity of each cell: 43 Ah

Number of cells: 14

Energy storage capacity: 2,1 kWh  
(21 Ah by 118 V)

Maximum total voltage 58,3 V

Minimum total voltage 42 V

Maximum current 250A

Max balancing current per cell 1A





SCHEMPP-HIRTH

FES

front-electric-sustainer

Simple and  
save  
operation





front-electric-sustainer

The first serial  
Ventus-2cxa FES  
for Peter Ditmar

He wrote:

*„...In der Luft den  
Motor noch ein paar  
Mal ausprobiert mit  
verschiedenen  
Einstellungen, läuft  
sehr schön.*

*Bremsen und  
positionieren ging  
einwandfrei...“.*

*Grüße Peter Ditmar*



# FES

front-electric-sustainer

At 5th of November 2015, the time had come for the first flight of the Discus-2c with an integrated FES sustainer – the Discus-2c FES. The surrounding conditions were just perfect: the sunniest autumn weather the curious audience could wish for and cloud thermal over the Alb.





**SCHEMPP-HIRTH**  
**FES**  
front-electric-sustainer

The Front Electric Sustainer (FES) electrical engine now also provides the Discus-2c with an environment-friendly, silent and intuitive to use insurance against unwanted outlandings.







front-electric-sustainer



Starting immediately and almost impossible to operate wrongly, this system - in combination with the Discus-2c's perfect control balance and well-known harmonic flight characteristics - provides the ideal solution for both ambitious competitive pilots and day-to-day usage in a gliding club.

## **FES**

front-electric-sustainer



Marginal  
aerodynamic  
disadvantage in  
flight practice



**SCHEMPP-HIRTH**  
**FES**  
front-electric-sustainer

## Competitions

Ventus-2cxa FES

Slovenian Nationals 2014

1. Place Luka Znidarsic

EGC 2015 - Luka Znidarsic

DSM 2015 – Bernd Weber

SGP World Final 2015 Italy

– Tilo Holighaus





**SCHEMPP-HIRTH**

**FES**

front-electric-sustainer

SGP Final in Italy with  
Ventus-2cxa FES





**SCHEMPP-HIRTH**

**FES**

front-electric-sustainer

FES also for the  
new Ventus!





## FES

front-electric-sustainer



To use the FES  
is fun!



FES

FES

FES

Thank you for  
your attention