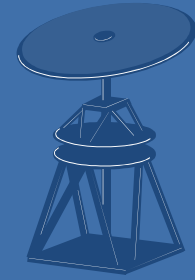


MERIT

Munich Experimental Rotor Investigation Testbed



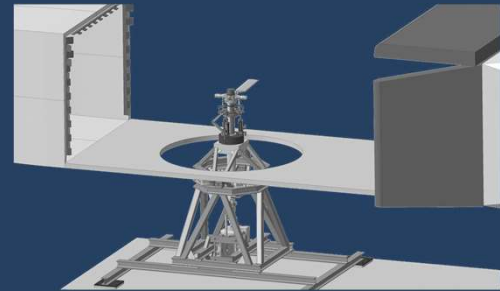
Conceptual Design

- Total height 2,60m
- Total weight 2t
- Blade tip speed
 $v_{tip} = 220 \frac{m}{s}$
- Rotor diameter
 $d = 1,80m$
- Hingeless rotor
- 1,2,4 blades



Application & Blade Design

- Investigation of Dynamic Stall in forward flight conditions
- Application in TUM's wind tunnel A, $v_{wind} = 50 \frac{m}{s}$

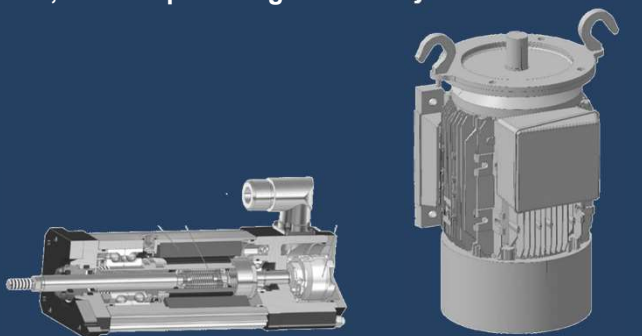


Windtunnel A, Chair of Aerodynamics and Fluid Mechanics, TUM

- Rigid, rectangular blade, no taper, no twist
- NACA0012 profile

Control System

- Synchronous motor: 85kW, 3000rpm, 270Nm
- Swashplate control mechanism
- 3 roller screw linear actuators
- 0,1° blade pitch angle accuracy

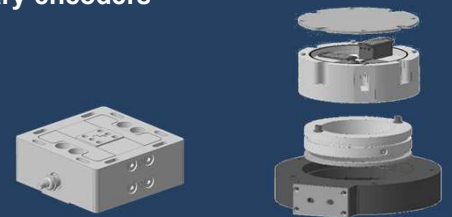


Linear Roller Screw Actuator, DIAKONT

Synchronous motor, NIDEC AUTOMATION

Measurement System

- 64 channel sensor telemetry
- Sampling rate 40.000s/sec
- Blade pitch angle hall sensor
- Instationary piezoresistive pressure sensors
- 4 3K force load cells
- Torque sensor
- 2 rotary encoders



3K Load Cell, ME Messsysteme

Telemetry encoder and coupler
MANNER Sensortelemetrie