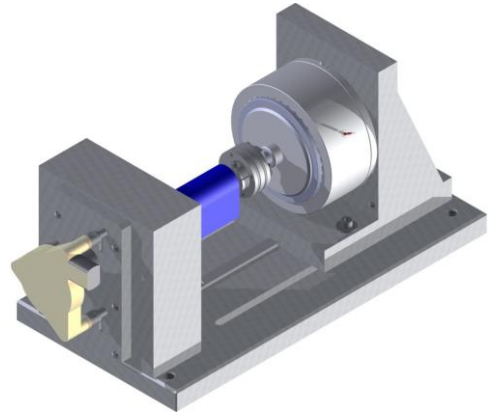


50 000 rpm Small Machine Test Benches

Technical data

- High speed electrical dynamometer (water cooled) with force transducer for torque measurements
- Inverter controlled permanent magnet servodrive
- Blocked force test bench for the measurement of gear motors with hysteresis brake

	High speed dynamometer	PM-servodrive	Hysteresis brake
Rated power	11 kW	940 W	200 W
Maximal power	30 kW	2 kW	1000 W
Rated speed	54 600 min ⁻¹	4500 min ⁻¹	7000 min ⁻¹
Rated torque	2 Nm	2 Nm	6.2 Nm



Equipment

- Electronic load EL 9000A from Elektro-Automatik
- Rapid Control Prototyping System: dSPACE DS1103 PPC Controller Board
- Inverter: Own design based on IRAMY20UP60B
- Controller and pulse pattern specification using dSPACE
- 4-Quadrant amplifier DM15000/PAS (Spitzenberger & Spies)
- HBM torque measuring shaft
- Shaft encoder (Incr. , SinCos, Resolver, ...)
- Three tri-axial force sensors 9017B from Kistler
- Three charge amplifier Nexus 2692 from Brüel & Kjær for signal conditioning
- Modular multi-channel front-end-system HEADlab from HEAD Acoustics for data acquisition
- Software ArtemiS from HEAD Acoustics for data acquisition and analysis

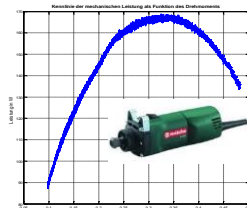


Application

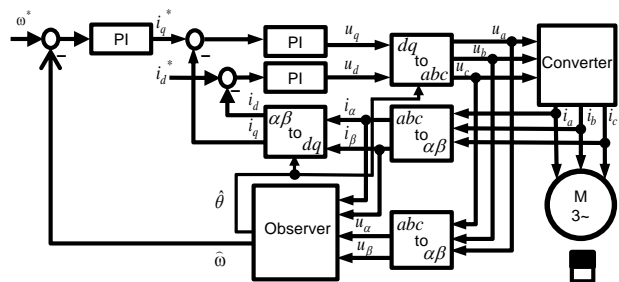
- Measuring of e.g. electric tools
- Verification of adaptive und encoderless control algorithms
- Study the impact of rolling bearing damages on the electrical parameter
- Automated measurement of the blocked forces imposed on the gear motor for noise characterization



Test carrier:
Controlled PM-Motor.



Measuring of a straight grinder.



Overall block diagram of encoderless control of PMSM.

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