

KISTLER

measure. analyze. innovate.

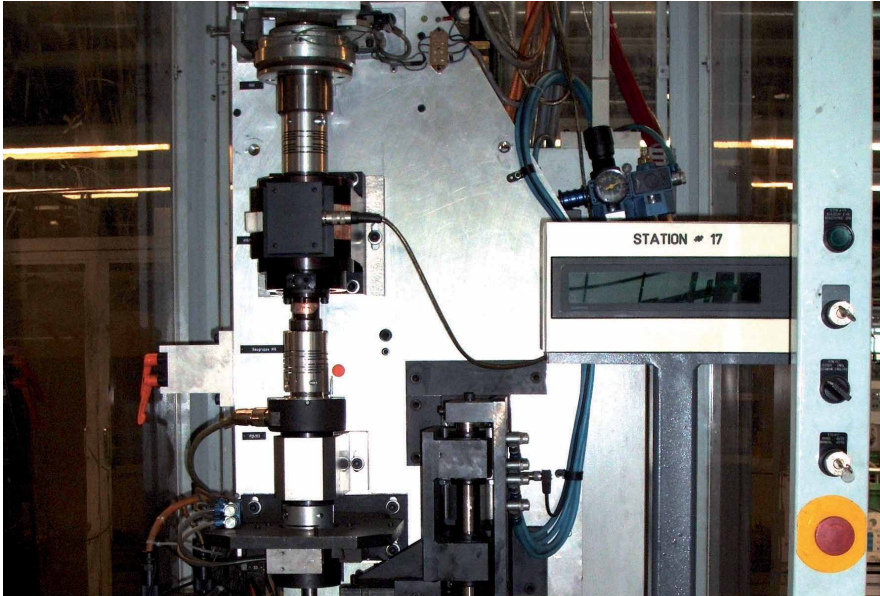
Test Stand Systems

for Electric Motors
and Gearing
at Laboratory (R&D),
Production (EOL)
and Quality Assurance
(QA)

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Test stand technology by Kistler

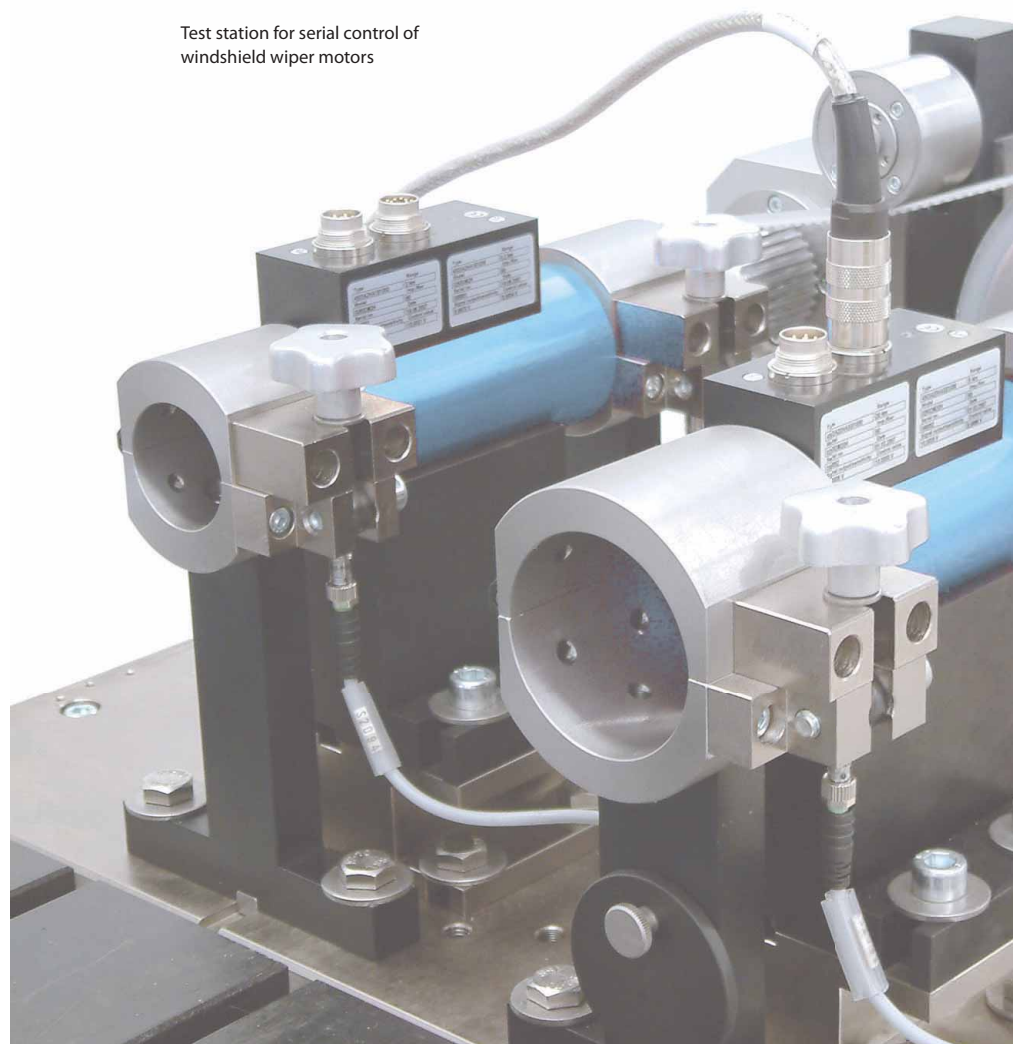


The scope of services comprises mechanical components such as drive test set-ups with torque sensors, small test stands with torque-/speed measurement and manual or external control, as well as computer controlled complete solutions for the analysis and documentation of electrical machinery.

By means of an integrated power analyzer, computer controlled test stands can be realized with up to 8-channel current-/voltage measurement, so that a separate efficiency specification of motor and converter can be effected even for converter fed drive systems.

The analysis of mechanical and electrical features, of the thermal evaluation, overload capacity and technical data of electrical machinery, of which the most important are efficiency and performance factor, today makes heavy demands on safe operability and flexibility of a test stand system.

Test station for serial control of windshield wiper motors



At a glance

Special features of Kistler test stand systems

- Modular design
- Use of active brakes (4-quadrant operation)
- Torque ranges 0,01 ... 25 000 N·m
- Power ranges 2 W ... 500 kW
- Speed ranges up to 120 000 min⁻¹
- High-precision power analyzer for electronic data logging
- Standard- and customized software packages
- Optimal project handling
- Worldwide after-sales service

Configuration

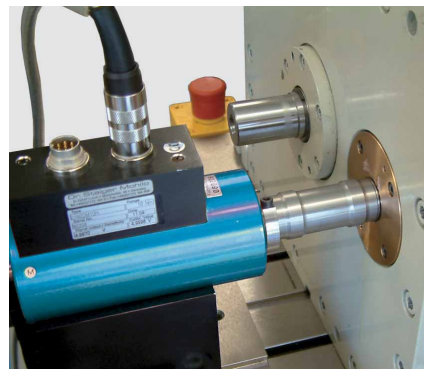
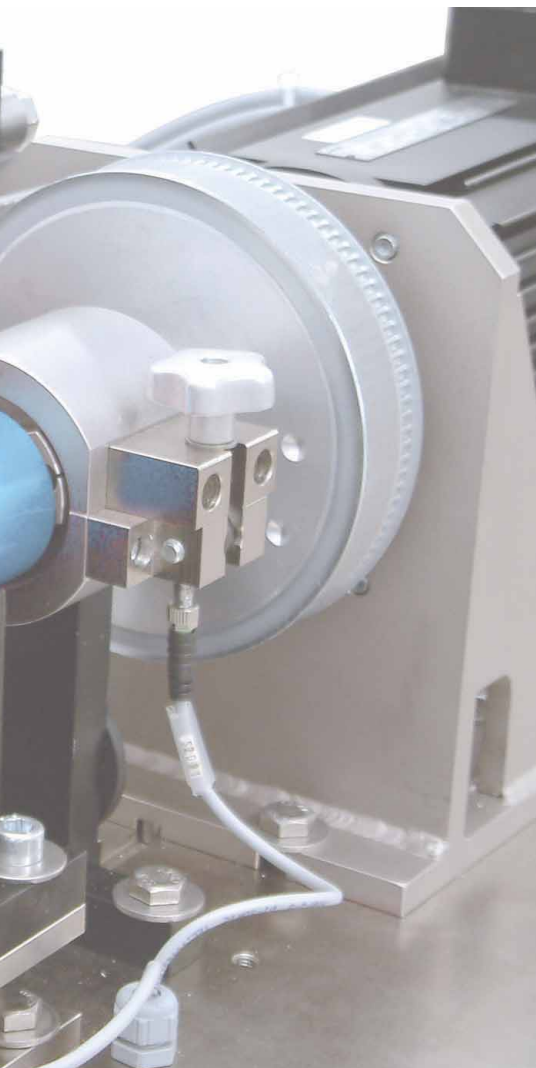
An optimal functioning mainly depends on the selection of mechanical and metrological components. Load is effected by an active brake, which works in 4-quadrant operation.

Only this version allows all the necessary functions especially in the laboratory field.

The modular software not only serves for collecting and presentation of measuring data, but also allows simulating of HIL (hardware-in-the-loop) as well as automation of measurement and test processes.



Test stand for electric motors with high-performance gearbox (efficiency >96 %)



Shaft 1 (directly): 70 N-m/8 000 min⁻¹
Shaft 2 (i = 1:7): 10 N-m/50 000 min⁻¹



Validation of electric power tools

Typical components

- Rack with lifting device
- Mounting plate
- Motor brake
- Torque-/speed sensor
- Gear unit for speed and torque adjustment
- Specimen retaining unit
- AC- and/or DC-motor supply
- Terminal box for specimen and temperature sensor
- Optional climatic chamber
- Activation hardware for motor converter (specimen)
- Measuring signal conditioning
- Computer-interface hardware
- Power analyzer
- PC with printer and network interface
- User defined software

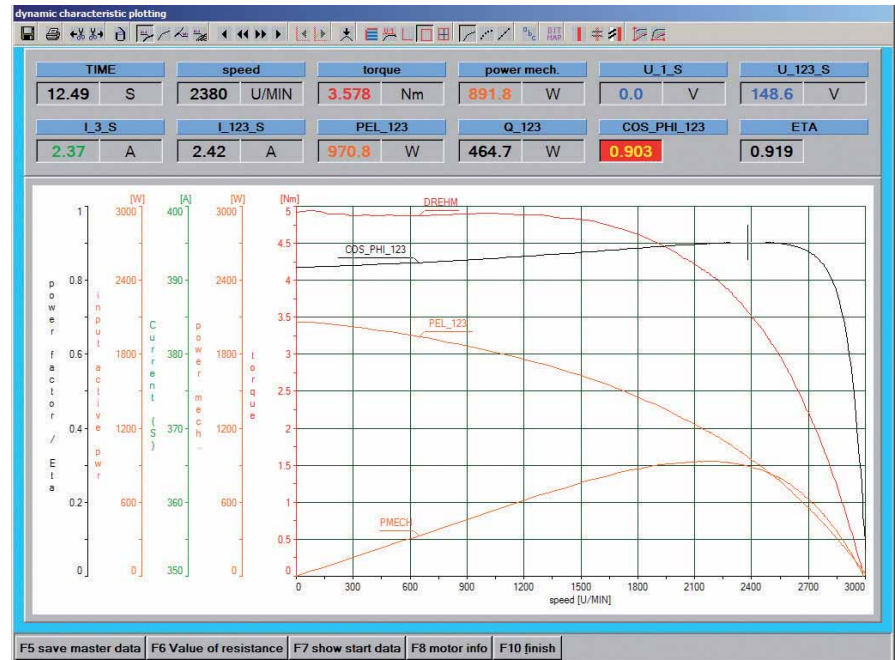
Software

Control

The software serves for parameter assignment of the test stand including the converter for the active brake and the test sequences of the test system, so that an optimum of profitability and precision is achieved.

Control functions

- Diverse test modules
- Manual operation
- Characteristic (dynamic, stepwise)
- Locked motor torque test
- Friction loss measurement
- Warm-up operation
- Static operation
- No load
- Families of characteristics
- Harmonic values
- Load cycles/cyclical load
- Step changes in load with transient data collection
- Load/start-up characteristics
- Recorder
- Customer specific applications
- Laboratory report



Monitoring

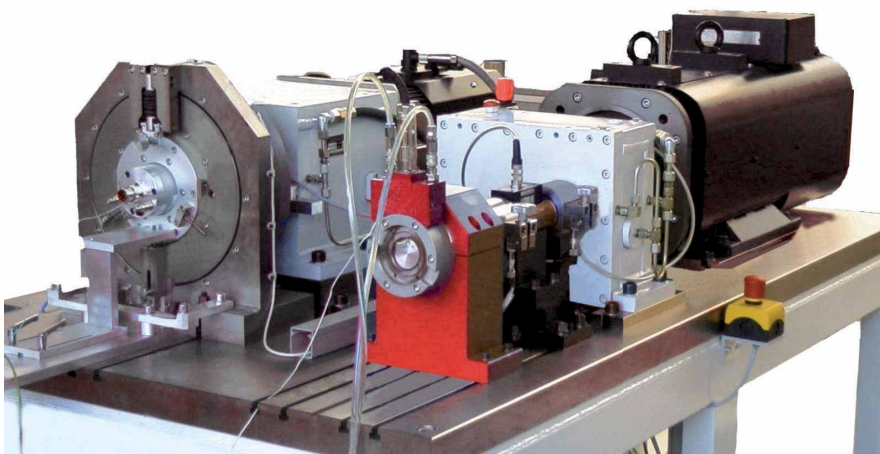
The software is especially useful for simulating loads of the cyclical working conditions of specimen. Additionally, measuring signals with limit values are

monitored to generate in production plants and quality control tasks on a go or no go decision.

Monitoring functions

- Menu controlled, multilingual user prompting
- High-speed data collection
- Menu controlled calibration of the torque sensor
- Graphic and numeric display and output (printer) of measured values
- Test parameter management
- Storage of the measuring data
- Processing of stored graphic data (scaling, color, section)
- Curve optimization and adjustment
- Data export/import
- Statistical evaluation

Test stand for electric motor spindles
(Speed 120 000 min⁻¹, 6 kW
Speed 50 000 min⁻¹, 45 kW)



From XS to XXL ...

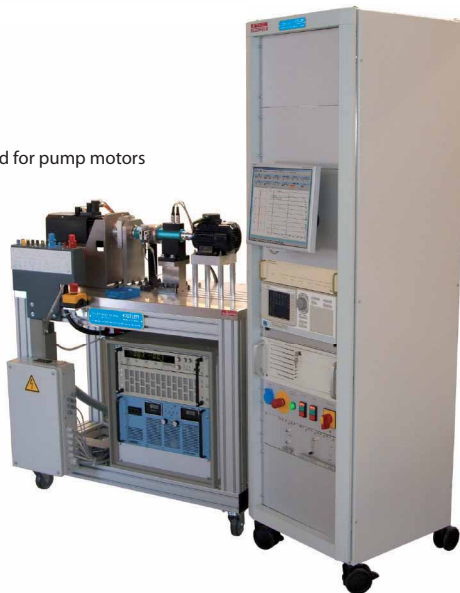
With scalable features such as lifting device, adjustable fastening of specimen, integrated torque calibration device, gear unit for torque and speed adjustment, climatic chamber, noise

insulation and much more, we will design the most suitable test stand solution for your individual requirements.



Loading unit for drives

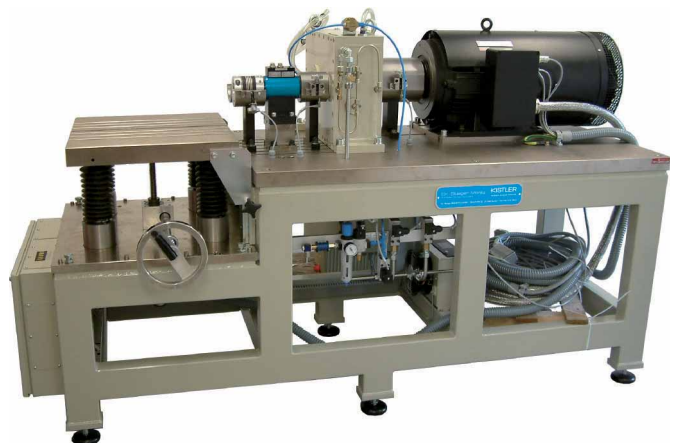
Test stand for pump motors



Test stand for gearboxes
(Vertical measuring alignment)

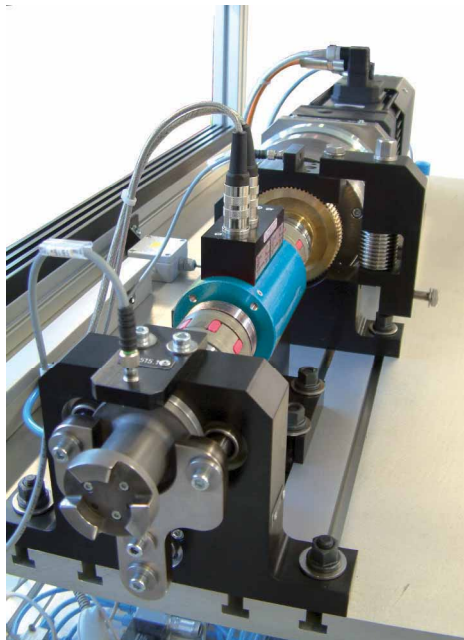


Test stand for blower motors



Electric motor test stand with lifting device
and high-performance gearbox

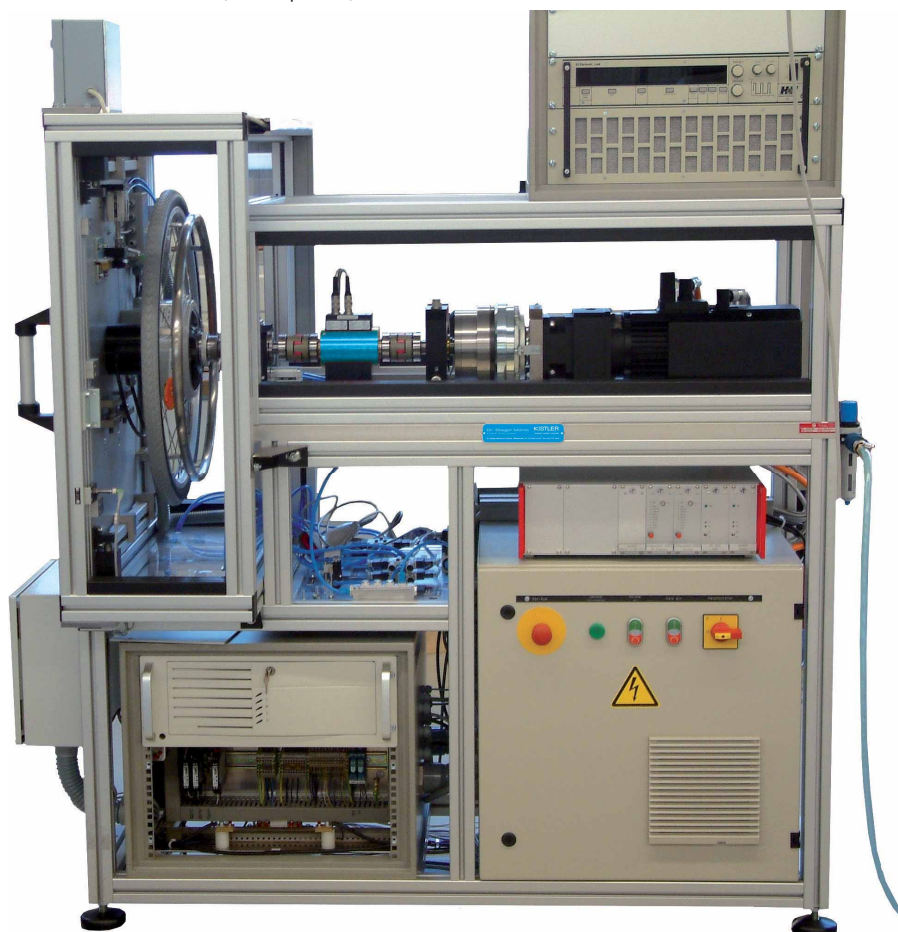
... nothing's impossible!



Test stand for wheelchair drives
(Final inspection)



Controller electronics for compact systems
(Mechanical set-up with noise insulation
and climatic chamber)



Torque measurement

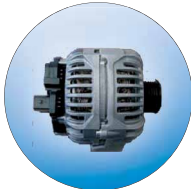
The precise measurement of torques at rotating drives and components is a very important criterion for an effective product designing and a safe quality control in production and assembly.

The universal dual-range torque sensor Type 4503A... therefore offers a variety of flexible application possibilities.



Torque sensor Type 4503A... dual-range sensor
with integrated speed measurement

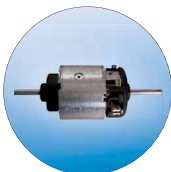
Test stand systems – for your motors, too ...



Motor vehicle generators



Vacuum cleaner universal motors



DC motors



Electronic motors



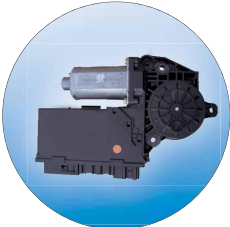
Windshield wiper motors



Drill hammers



Angle grinders



Window lifters



Induction motors



AC motors



and your motor ...




Test stand for window lifters and seat adjustment

Performance portfolio

Type of test stand	Specimen	Range of performance*
Electronic motor test with and without load for development and laboratory	1+3 Ph AC-drives, gear-motors, DC-motors, synchronous motors, converter/controller plus motor	10 W ... 500 kW 0 ... 120 000 min ⁻¹ 0,05 ... 25 000 N·m
Generator test stands for R&D	DC- and AC-generators, starter generators	100 W ... 150 kW 0 ... 50 000 min ⁻¹ 0,05 ... 500 N·m
Continuously operating test stands for electrical drives and generators, optional with climatic chamber	Standard motors, electronic tools, motor vehicle generators	10 W ... 150 kW 0 ... 20 000 min ⁻¹ 0,05 ... 500 N·m -40 ... 180 °C
Measuring and evaluation of friction torque at rotating components	Bearings, switches, ball screws, gear boxes	0 ... 10 000 min ⁻¹ 0,05 ... 1 000 N·m
Test stations for final inspection in manufacturing/assembling	Electric drives, general	10 W ... 150 kW 0 ... 20 000 min ⁻¹ 0,05 ... 500 N·m

*) extra ranges on request

Rotating torque sensors (selection)

	Type	Measuring range [N·m] min. - max.	Accuracy class	Mechanical connection	Max. speed [min ⁻¹]
	4503A... Digital dual-range sensor with brushless transmission (data sheet 4503A_000-595)	0,2 ... 5 000	0,1	Shaft	50 000
	4504A... Torque measuring flange – short profile, robust, bearingless, high accuracy (data sheet 4504A_000-598)	50 ... 5 000	0,1	Flange	15 000

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