

Com.: 539174

Electric Motor Test Stand for BLDC Actuators

Test stand for motor measurement in the laboratory for new and further development of mechatronic components used for modular robotic designs.

The following is determined during the test sequence:

- torque
- speed
- temperature
- axial and radial force
- rotation angle

Description

The dynamically determined variables are shown online, evaluated and then archived in a process database.

Optimally configured active load units in 4-quadrant mode are used to load the test objects.

Model 4503A... torque sensors are used to detect the dynamic torques.

Finely adjustable linear drives are used to apply the axial and radial forces and force sensors measure the concomitant forces.

Thermocouples can be connected to the 4-channel unit to measure the temperature.

Use of this precision measuring equipment allows conclusions to be made on product optimisation and further development.

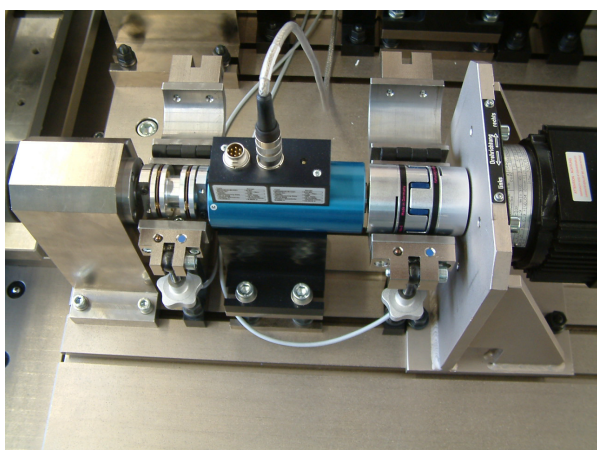
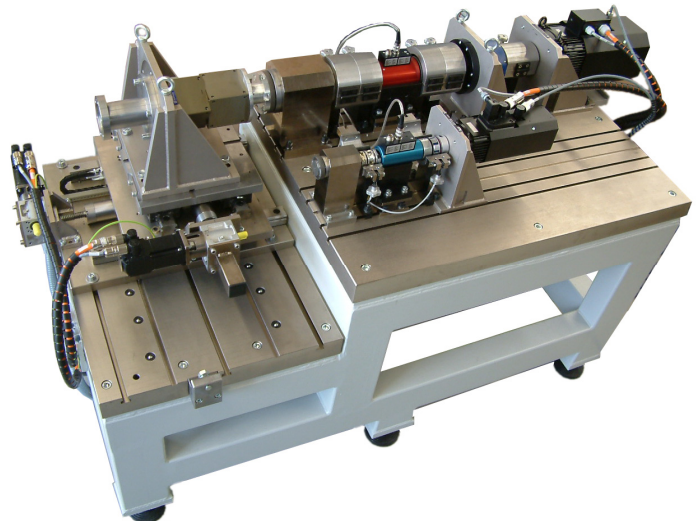


Fig. 1: Power train with Model 4503A... torque sensor, coupling and burst protection

Model Z90539174



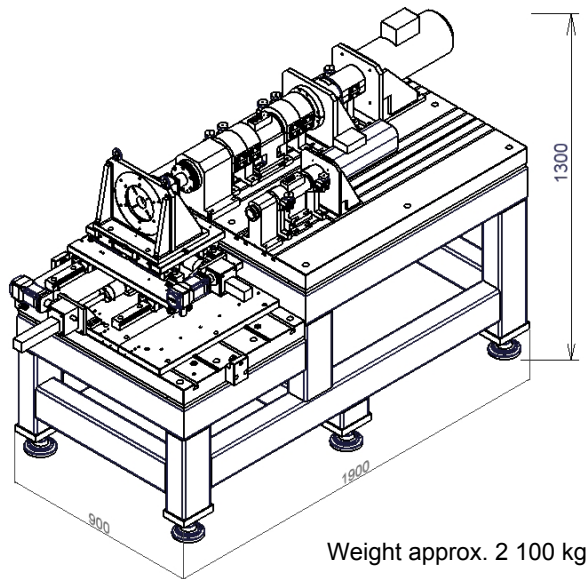
Technical Data

Drive / load machine 1		
Power	kW	5
Torque	N·m	32
Drive / load machine 2		
Power	kW	1.2
Torque	N·m	3.9
Temperature measurement		
Measuring range	°C	-40 ... 150
Axial force	N	1 000
Radial force	N	5 000

Technical Data of X-Y Force Control

Axial force	N	1 000
Axial force stroke	mm	150
Radial force	N	5 000
Radial force stroke	mm	± 25

Dimensional Drawing



Weight approx. 2 100 kg

Fig. 3: Mechanical configuration

Mechanical Configuration

The massive base frame is made of welded steel profile. The power train components are mounted onto fluted base plates allowing for a variable configuration. Centre flutes ensure that the components can be exactly aligned in a minimum of time. All rotating parts are equipped with burst and hand guards compliant to the accident prevention regulation. Steel parts have been surface-treated and are therefore protected against corrosion. The test object is attached onto a massive retention bracket. Various test objects are flange-mounted using exchangeable adapter plates.

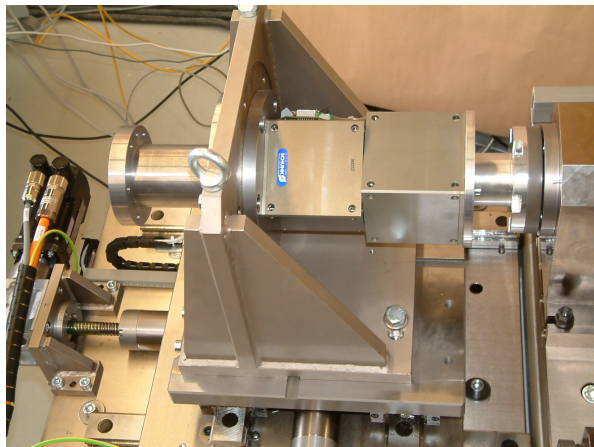


Fig. 2: Test object attachment with massive retention bracket

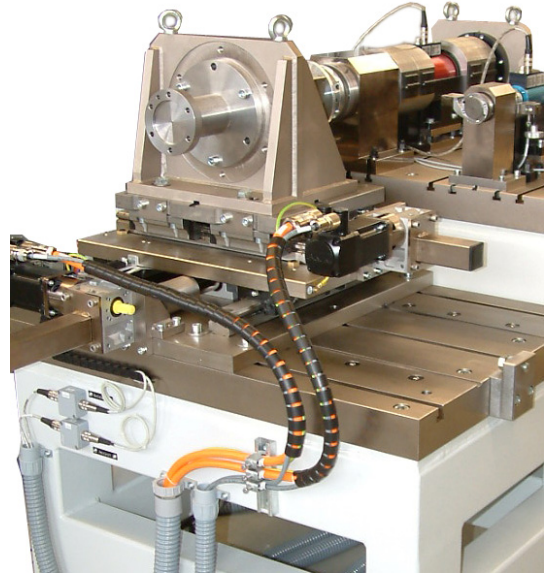


Fig. 3: X-Y force transmission

To simulate a real situation on the test stand, the test objects are loaded both axially and radially (X/Y). Flexible, configurable test sequences simulate the real situation and verify the long-term stability of the drive system in load cycles. Weaknesses can be detected and remedied and the product quality is improved. The complete force transmission unit can be shifted on a fluted mounting plate allowing it to be operated alternately on axis 1 or axis 2.

Interfaces

The test object power converter can be controlled by an analogue interface, Profibus or CAN bus. A DC power supply is integrated for the feed of the test object.

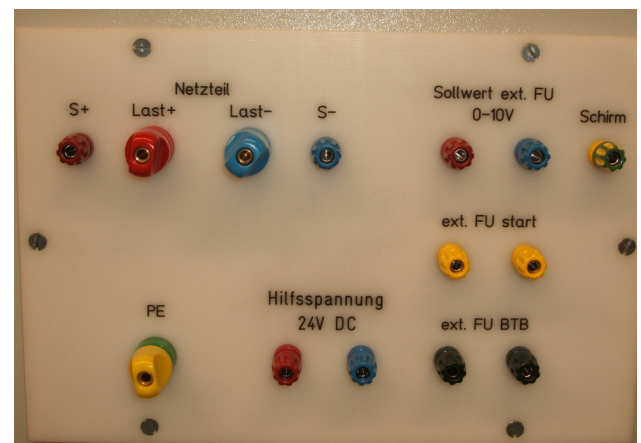


Fig. 4: Interfaces

Electrics

Length: 1400 mm Width: 600 mm Height: 2250 mm
Weight: 450 kg



Fig. 5: Measuring equipment control cabinet

Configuration of measuring equipment cabinet:

- 1 Power electronics control cabinet
- 2 Measuring equipment control cabinet
- 3 Electronic load
- 4 DC mains supply
- 5 PC

Control

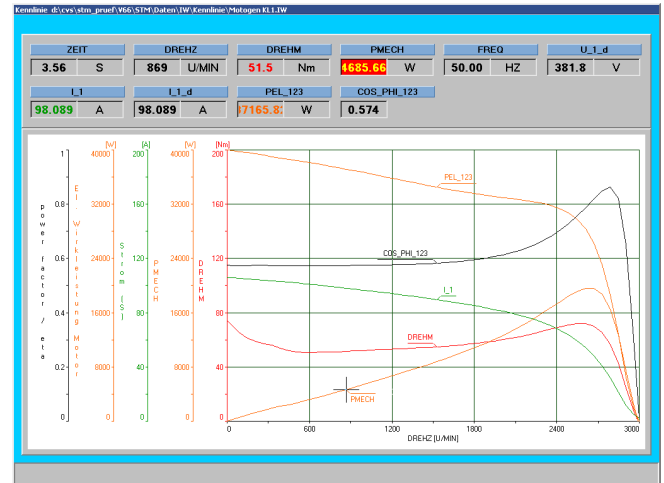


Fig. 6: Display of measurement result

Software control functions

- Manual operation
- Blocking measurement
- Curve (dynamic, in steps)
- Warm-up runs (S1,S2,S3,S6)
- Cyclic load