Customized drives and systems

SERVAX Laboratory

SERVAX
DRIVES

Measuring, Optimizing and Reporting

SERVAX has many years of experience and an extensive knowledge in developing, manufacturing and measuring customer-specific electric motors and systems.

Customer-specific prototypes as well as electric motors from technology projects are tested according to current IEC standards on state-of-the-art testing facilities in our laboratory. In order to ensure the high quality of the measured data, the measuring equipment used is regularly calibrated to the highest standards. The measured data are processed, analyzed and comprehensibly documented by our experienced engineers in order to obtain important insights. The SERVAX laboratory is also at your disposal to test your electric motor or your complete drive system.

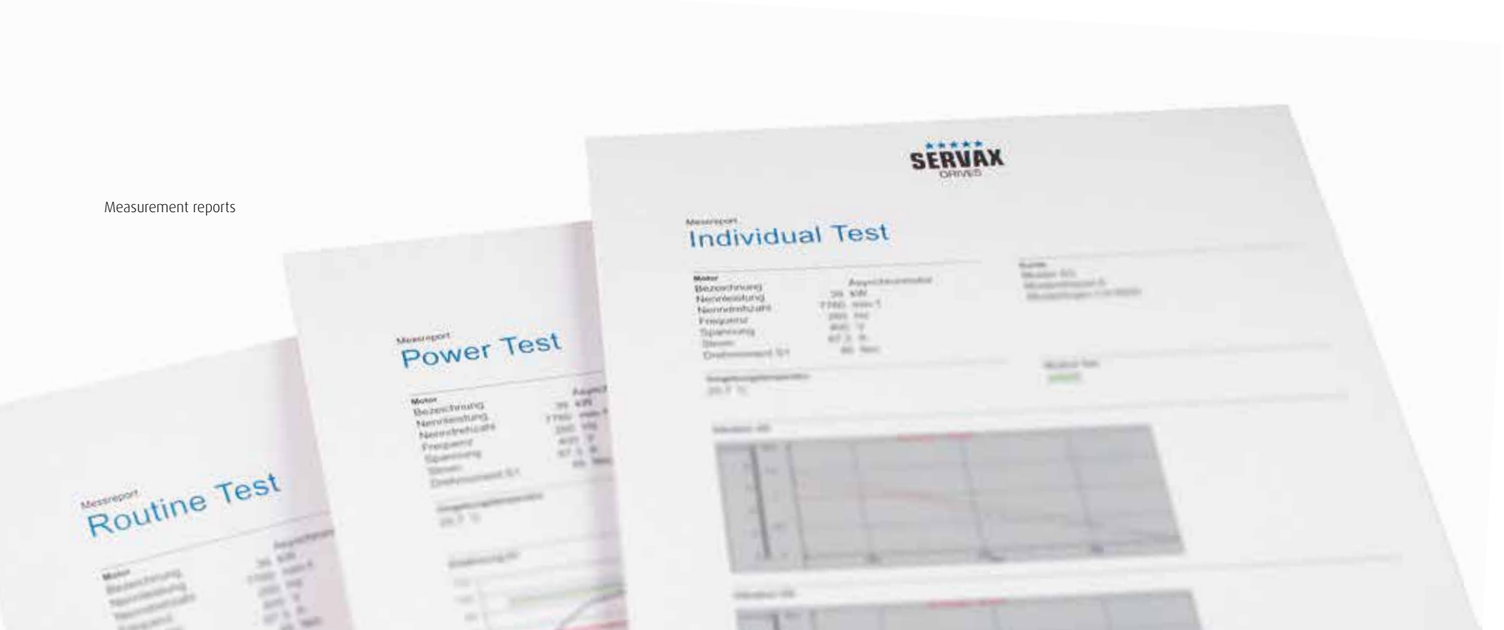
We Get the Most out of Your Motor

Individual tests for individual requirements – a case study
A well-known and globally active European machine tool manufacturer mandated the SERVAX laboratory to test the prototype of a tool spindle. The electric motor developed by SERVAX – a set of motor components – was assembled in the laboratory together with gearbox, oil cooler, inverter and control system for the tests.

The technical data:

Torque	2000 Nm
Power	40 kW
Stator diameter	500 mm
Total weight of the unit	2.5 t

Testing the powertrain consisting of motor – gearbox – inverter – control unit
The SERVAX engineers commissioned the complete unit and performed measurements over the entire load range. The measured data were subsequently evaluated and documented in detail. The test result confirmed the accurate electrical design under realistic load condition in accordance to customers' requirements.



Measurement reports

Realizing the Full Potential

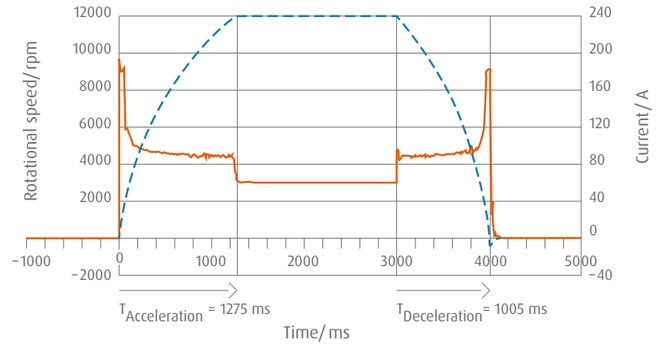
Parametrizing
The parameters for the motor/inverter combination are determined during the commissioning stage. By subsequently loading the motor in our laboratory environment, the parameterization can be adjusted for optimum operation. The optimized parameterization prevents premature failures and reduces machine downtime.

Product optimization
Analyzing performance data by testing the motor or drive train under realistic load condition identifies optimization potentials.

Quality documentation
All measurements are documented clearly and comprehensibly in a measurement report. The calculated performance data of the drive is thereby confirmed by measured values achieved under realistic conditions.

Increasing the efficiency of a machine tool – a case study
In order to reduce the non-productive time after a tool change, the acceleration to maximum speed as well as the deceleration to standstill of the main spindle needs to be less than 1500 ms. The maximum available electrical current is 190 A. SERVAX has built the main drive for the machine tool according to these requirements. Thanks to a clever motor design combined with the optimization of the parameters based upon the measurements, the required acceleration and deceleration times could even be undercut.

Acceleration and deceleration diagram of a tool spindle



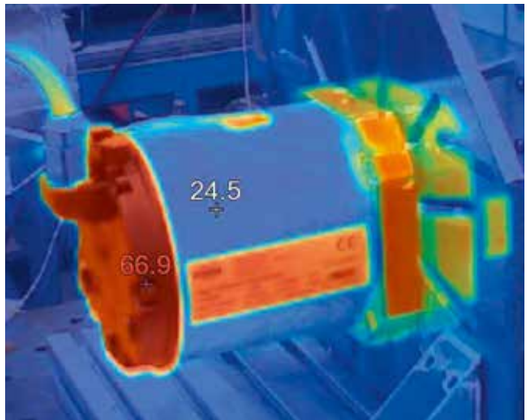
Our Experience – Your Benefit

Many years of experience
We have been testing motors for as long as we have been building them. The measurement data and findings from the tests are used in the ongoing improvement of the finite element calculation models as well as in our technology projects. As a result, our customers benefit from continuous optimizations.

A perfectly equipped laboratory
We have been continuously developing our laboratory for decades. In addition to modern and high-quality standard equipment, it includes in-house developments adapted to our specific needs. The infrastructure also comprises various test benches, frequency converters, induction controllers, coolers and comprehensive measurement technology.

Scope of the services

- Setting up an individual test plan based on your requirements
- Preparing and setting up the necessary interfaces as well as handling and transporting of your equipment
- Assembling and commissioning of synchronous and asynchronous motors, including encoder or resolver
- Carrying out measurements in accordance with IEC standards, with assistance provided by our competent specialists
- Documenting the measurement results in the form of an individual test report



Measurements According to IEC Standards

Measuring efficiency	Efficiency measurement at the converter according to IEC60034-2-3
	Efficiency class according to IEC60034-30-1 and -2
	Efficiency measurement on the grid according to IEC60034-2-1
	Determining losses – Iron losses – Copper losses – Mechanical losses
Load measurements according to IEC60034-1	Torque-current measurements
	Cyclical loads (e.g. S1, S3, S6)
	Comparison measurements
	Measurements of breakdown torque
	Temperature rise measurements
Vibration measurements according to IEC60034-14	Frequency analysis
	Runout behavior analysis
	Vibration velocity
	BCU
Additional measurements	High-voltage testing
	Winding resistance and symmetry
	Regenerative measurements
	Temperature measurements of PT100/PT1000, KTY, T/K/J elements
	Temperature measurements using an infrared camera
	No-load testing
	Adjusting encoders
	External measurements taken at the customers' premises
Existing infrastructure	Four load machines ranging from 1 kW to 150 kW
	Rotational speeds up to 40,000 rpm
	Frequency converter up to 120 kW / max 280 A, output frequency up to max 1500 Hz
	Liquid cooling, measuring temperature at input/output and flow rate
	Oil/air lubrication
	Two indoor cranes max 3.2 t
	Extensive stock of clamping devices, couplings, cables etc.

All our measurements are carried out in accordance with current IEC60034 standards.

customized drives, perfectly crafted

For nearly 100 years, SERVAX drives have formed the heart of sophisticated machines and equipment. Our range also includes certified automatic safety machine door systems and versatile VITAX grinding systems.

We would be happy to show you how you can achieve added value with perfectly integrated drives.
www.servax.com

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WM-048 en 11.19 Subject to modifications