

# RQA125/SATS-2

## Rotor Quality Analyzer



### Introduction

The RQA 125/SATS-2 Rotor Quality Analyzer is our most popular and advanced tester for quality control in manufacturing of squirrel cage rotors. It has been designed for use in a laboratory or industrial environment.

This stand alone system is configured for automatic inductive and power measurement with manual loading and unloading of the rotor.

The test cycle is started by pressing a start button. All measurements and result evaluations are automatically conducted, processed, evaluated and stored for statistical evaluation.

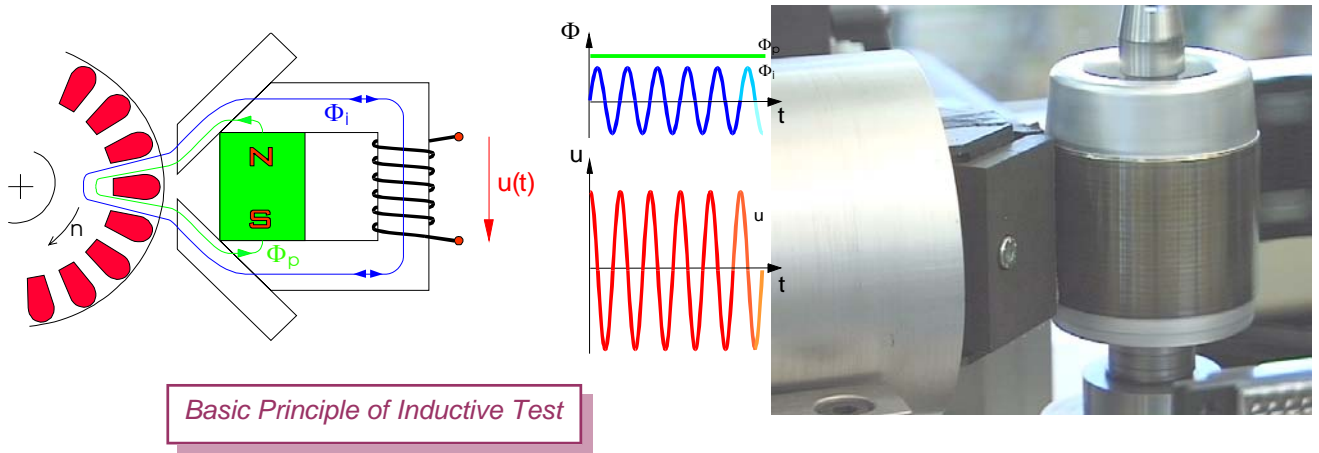
The automatic test cell is protected with an infrared light grid barrier.

These testing procedures are used for the detection of quality problems in the production of squirrel cage rotors at an early stage. Beside problems in individual rotor bars such as interrupted bars, air enclosures, porosity and wrong skew also problems caused by changes in consistency of aluminum or steel lamination can be detected.

The test parameters inductive overall value as well as rotor resistance and rotor reaction show direct correlations to major motor characteristics such as start-up torque and efficiency.

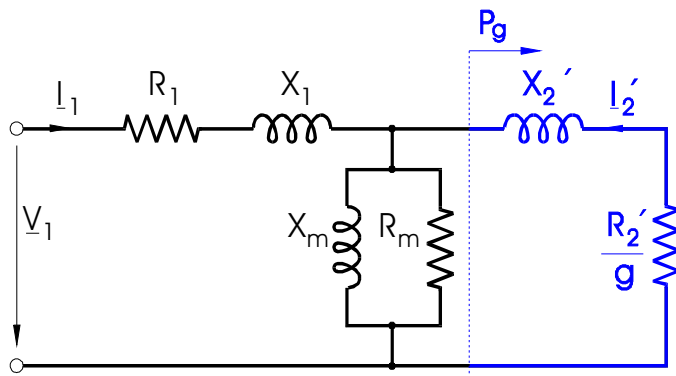
## Test Methodology / Software

### Induktive Measurement

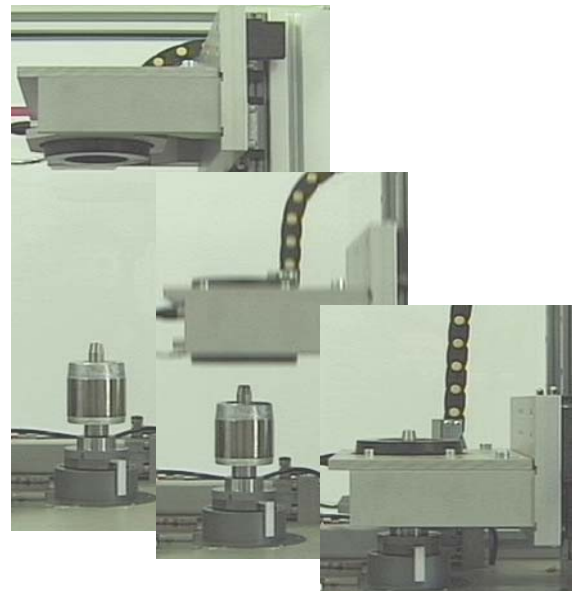


The inductive measurement is realized by spinning the rotor in close proximity to the inductive sensor. As the bars move through the magnetic field a current is induced in the rotor bars. The resulting sinusoidal waveform, in which each complete cycle represents one rotor bar, is evaluated according to a predetermined set of tolerances in an examination profile.

### Power Measurement



*Schematic for Power Measurement*



The power measurement utilizes a special test stator to facilitate a comparison-based evaluation of the rotor resistance and reactance. By measuring rotors under the exact same test conditions it is possible to derive the reflected rotor resistance and reactance values of production rotors. These resistance and reactance values are what define the performance capability of the rotor and ultimately the assembled motor. It is here, in the early stages of production that the greatest cost savings can be realized.

**RQA Win Software**



- User friendly menu-driven windows based software for automatic Accept/Reject evaluation of rotors according to user selected parameter tolerance levels.
- Automatic set-up of all measurement and evaluation procedures (parameter tolerances) via the selection and retrieval of the *Master Parameter File* (reference rotor).
- Automatic learn feature to establish new *Master Parameter Files* for additional type of rotors to be tested.
- Automatic fault classification into different error types
- Integrated counter for the total number of tested and failed rotors, and a complete record of the specific type and frequency of fault errors is recorded.
- Complete statistics package to facilitate a complete and thorough analysis of both rotor quality and productions capability.
- Interactive parameter tolerance functions via a "what if" approach in combination with the present and recommended  $C_p$  and  $C_{pk}$  values.
- Zoom function for rejected rotors automatically records all measurement results including the inductive waveform for more thorough analysis of the fault mechanism.

*Measuring Screen*

**Combined approach with both inductive test and power measurement for most thorough analysis of die cast rotors**

**Features**

- **Most sophisticated testing system for squirrel cache die cast rotors.**
- **Standardised by leading manufacturers of electrical motors and compressors world-wide.**
- **Wide range of application up to rotor OD of 125 mm.**
- **Optional tooling for testing of both - rotors with or without shaft.**
- **Fully automatic testing and evaluation cycle.**
- **Cycle time of approx. 6 sec. plus loading, allowing 100% testing of production series.**
- **Fostering SPC - In-process Monitoring and Correction.**
- **Easy set-up for different type of rotors to be tested.**
- **RQA Win Software based on Windows XP including statistics and zoom.**

## Technical Data

Rotor Quality Analyzer	RQA 125/SATS-2
Maximum rotor dimensions	outside Ø 125mm, stack length 150mm without shaft, optionally with shaft
Loading of test rotors	manually
Testing cycle / time	Fully automatic / minimum 5.5 seconds plus loading
Testing methods	Inductive test for rotor bar analysis and resistance/reactance test for general quality and performance
Industrial PC	Industrial PC min. 2.8GHz, HD 80GB, Floppy Disk, CD-ROM, A/D Data Acquisition Card, Optically Isolated I/O Board
Automatic controls by	PLC
Rotor clamping mechanism	modular Precision Dual-conic Expandable Arbor Rotation Mechanism for rotors without shaft, optionally available Clamping Mechanism for rotors already fitted with shaft
Rotor rotation for test by	Variable frequency drive and reluctance synchrone motor
Pneumatic activation of	Rotor Clamping, Movement of Inductive Sensor and Movement of Measuring Stator on mechanical slide with precision linear guides
Synchrone start feature	for physical identification of defective rotor bars
Rotor temperature measurement	On integrated Rotor Temp. Measurement Station with PT100
Measuring stator	Moulded measuring stator with built in temp. sensor and quick change connector, mounted to special holding plates with precision guiding bolts for exact placement - required for each rotor family. Supplied on extra cost - original stators according to Deltatronic specification to be supplied by customer adjustable position of mechanical slide for positioning of stator towards test rotor
Inductive sensor	With exchangeable Pole Shoes to match different rotor stack length, adjustable angle of magnetic field in steps of 0.1°, adjustable vertical position and adjustable gap towards the test rotor (micrometer)
Operator security	Infrared light grid barrier for protection, emergency STOP button
Pneumatic system	with water separator, pressure gauge, soft start facility and monitoring of minimum pressure, control valves Requested Supply: Dry pressured air, minimum 6 bar
Electrical Supply	Single phase 230V, 50/60 Hz or 110V, 50/60Hz to be specified with purchase order
Dimensions approx.	width 700mm + 600mm (monitor), depth 600mm, height 1.820mm
Packing (box for air freight)	length 210cm, width 85cm, height 90cm
Weight approx.	net 290 kg, gross 340 kg



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TECHNOLOGY

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