RXA 120/SATS

Rotor Quality Analyzer

Experts in testing rotors

Introduction

The performance i.e. quality of electrical induction motors is depending on the quality of the rotor built into the motor. Thus quality assurance of this important component is more and more becoming to be a major issue. For critical applications such as hermetic compressors, pumps etc. continuous quality monitoring of the rotor has been applied for many years and has proven to be the key for superior product quality.

The **RXA 120/SATS** is designed for fast, accurate and simple testing of rotors after die casting or before assembly, before additional costs are invested in the component or the end product. This comparison based tester is integrating most advanced testing technology. A high technology active measuring stator enables the measurement of rotor resistance R2, rotor reactance X2, rotor overall inductance and property of individual rotor bars in one test cycle. The measured i.e. calculated parameters rotor resistance R2, rotor reactance X2 and induction correlate to performance characteristics such as efficiency, no load rpm and start ability of the rotor.

Strategic advantages

Eliminate customer and end-user returns:

- Eliminate new product motor failures due to faulty rotors.
- Alleviate under-spec. motor returns due to faulty rotors.

Reduce production costs:

- Optimize production processes to meet specifications.
- Recover faulty parts by reprocessing.
- Reduce value added costs by eliminating extra processing costs for rotors which cannot be rejuvenated.

Understanding industry trends:

- Trend towards outsourcing and centralized casting operations makes testing even more critical, as motor manufacturers need to be assured of the quality of the rotors being delivered.

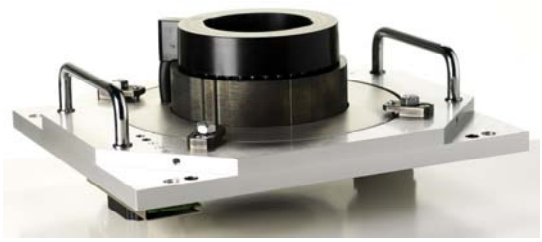
RXA - advanced testing technology for ease of use

Description

The RXA 120/SATS Rotor Quality Analyzer is our newest automatic testing system for squirrel cage rotors for laboratory or industrial use. This re-design of the model RXA 101d is now integrating all modules in one single desktop station. A special desk with roller wheels is included in the scope of supply.

The RXA 120/SATS is designed as tandem station allowing change of test rotor while testing a rotor. The cycle time thus is as short as approx. 6 seconds per rotor.

During the test, the test rotor is being magnetized by a special high technology measuring stator with built-in active electronics and sensor technology. Thus all evaluation parameters rotor resistance R2, rotor reactance X2, inductive overall evaluation and property of all individual bars are measured in one test cycle.



The RXA 120/SATS is integrating an industrial PC with 17" TFT monitor, hard disk, floppy disk, CDRW drive, front USB, LAN, fold-in drawer with keyboard and mouse - operated under Windows XP.
The approved RQA Win V2.0 testing software is including a sophisticated statistics and zoom package for SPC controls of production quality and detailed analysis of production problems.

For each rotor type a Master Parameter File is established memorizing all testing parameters and tolerance values for automatic Good/Bad evaluation.

The system is designed for easy adaptation to different type of rotors to be tested. Only the measuring stator plates and the special holding shafts or collets need to be changed. There is no need for adjustments after changing to a different rotor type.

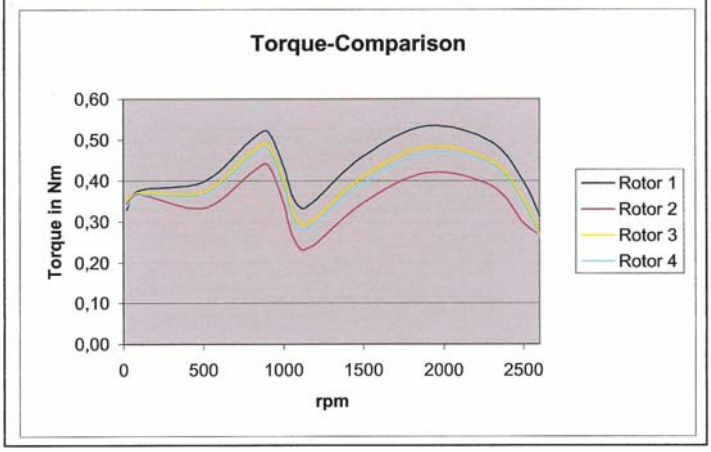
For testing the rotor is put onto a special holding shaft. For testing of rotors already equipped with shaft, special collets are available.

The test cycle is started by pressing two start buttons, one on either side of the station. For operator safety, both buttons need to be pressed while the rotor is entering into the measuring stator. The test cycle is being performed fully automatically. During testing the test rotor is rotated slowly. At the end of the test cycle the rotor is automatically evaluated Good/Bad according to pre-programmed tolerance values. There are separate good/bad lamps for either side of the tandem test stations.

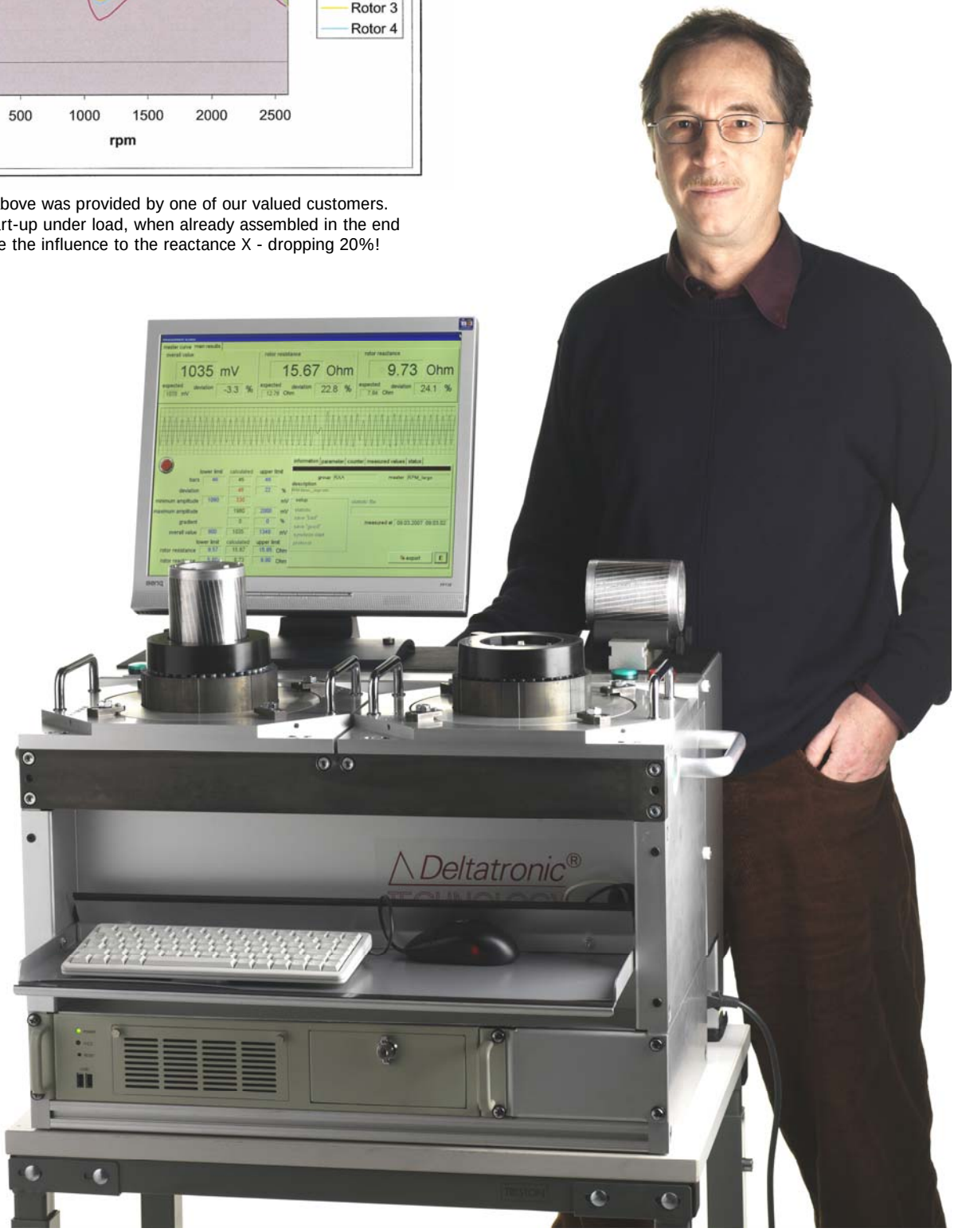
Features

- Most advanced proven testing method for die casting rotors.
- Evaluation of individual bar properties and overall performance.
- Fully automatic testing with Good/Bad evaluation according to pre-selected parameter tolerances.
- Wide range of application up to rotor OD of 120 mm.
- Cycle time of approx. 6 sec. per rotor enables 100% test of production lots.
- Tandem station for change of test rotor during testing.
- Data bank for unlimited number of master parameter files (rotor type).
- Simple and fast set-up to different test rotors—no adjustments required
- RQA Win Software based on Windows XP including statistics and zoom..

	Rotor 1	Rotor 2	Rotor 3	Rotor 4	
R-Rotor	22,60	20,85	22,00	21,75	Ohm
X-Rotor	43,90	33,75	40,75	40,45	Ohm



The chart shown above was provided by one of our valued customers. Rotor 2 did not start-up under load, when already assembled in the end product. Please see the influence to the reactance X - dropping 20%!



Technical data

Rotor Quality Analyzer	RXA 120/SATS Tandem
Maximum rotor dimensions	outside Ø 125mm, stack length 150mm without shaft, optionally with shaft
Loading of test rotors	manual, Tandem station allowing change of test rotor during testing
Testing cycle / time	Fully automatic / minimum 6 seconds
Testing methods	resistance/reactance test for general quality and performance, magnetic bar scanning to evaluate property of each bar and overall inductance
Industrial PC	Industrial PC min. 2GHz, HD 100GB, Floppy Disk, CD-RW Combo, A/D Data Aquisition Card, 2x front USB, LAN
Automatic controls	Software controls by Industrial PC
Rotor holding mechanism	Advanced shaft system for customer specific rotor ID, easy exchangable for different rotor ID, special exchangable holding system for rotors equipped with shaft
Rotor rotation for test by	Separate DC motor drive for each side of the tandem test station
Rotor temperature measurement	integrated Rotor Temp. Measurement Station with PT100
Measuring stators	Moulded measuring stators with built in temp. Sensor, magnetic bar sensor and active electronics, system connector plugged when placed, mounted to special holding plates with precicion guiding bolts for exact placement - required for each rotor OD-family. Supplied on extra cost - original stators according to Deltatronic specification to be supplied by customer
Operator security	2 button security system placed on either side of the test station, both buttons need to be pressed during rotor vertical movement
Electrical Supply	Single phase 230V, 50/60 Hz or 110V, 50/60Hz to be specified with purchase order
Dimensions approx.	width 750mm, depth 500mm, height 790 m (with LCD monitor) Delivered with special table equipped with roller wheels and adjustable height
Packing (box for air freight)	length 120cm, width 85cm, heigth 90cm
Weight approx.	net 60 kg, gross 100 kg

Detectable faults

- Broken or interrupted rotor bars.
- Cold soldered or missing connection between bar and end ring.
- Porosity either in the end rings or the rotor bars due to faulty injection processes, inferior aluminum alloy quality, and/or gaseous contamination.
- Insufficient oxidation between aluminum rotor bar and steel core resulting in the phenomenon known as soldering.
- Deviation of the rotor bar angle (skew).
- A short circuit between two or more rotor bars (fining).
- Eccentricity problems.
- Material inconsistencies in the aluminum alloy.
- Material inconsistencies in the steel core.

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