



High Speed Rotor Spin Test Rig

Description

Design & manufacture of a small rotor, high speed spin test rig, with a maximum speed of 30,000 RPM for testing aerospace motor rotors up to 22 kg and 305 mm long. The rotors are “simply supported” at each end by a driven precision head assembly and driven precision tail assembly. The head assembly is driven by an AC synchronous motor via a high speed gearbox.



Control Console

To enable rotors of different lengths to be tested, the tail assembly position is adjustable. The rotor was designed to run sub-critically, using pre-loaded SiN angular contact bearings. These were grease lubricated. The test rig speed was controlled by an inverter.

Specification Summary

- Max speed = 30,000 RPM
- Max rotor length = 305 mm
- Max rotor mass = 22 kg (capacity for 34 kg)
- 9 kW AC synchronous motor with high speed gearbox
- Inverter controlled
- Sub-critical, simply supported rotor design
- Adjustable tail assembly for various rotors
- Grease lubricated precision angular contact bearings



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Disciplines Used

- Conceptual & mechanical design, stress FEA, rotordynamics analysis, manufacture, assembly, test & commissioning.