



Wind Tunnel Rotary Probe Traverse Systems

Description

Design & manufacture of high accuracy systems, typically to position a range of aerodynamic probes in a 3 m x 4 m x 6 m, Mach 0.3 working section.

The probe systems are constructed from high modulus CFRP, optimised to minimise deflection, aerodynamic loading and flutter / vibration.

A positional accuracy of +/- 1 mm was achieved using a high accuracy calibration method and unique laser deflection measurement system. High ratio, low backlash, low weight harmonic drives were used with encoder feedback and bespoke opto-electronic switches for accurate positioning.

All signals & power were transferred through the rotating joints by purpose designed slip rings, the pressure signals being converted to electrical signals by an on board transducer. Finally, an integrated capacitive sensor system was used for collision avoidance.

Disciplines Used

- Conceptual, Mechanical & Electro-Mechanical Design
- Electronics & PCB Design
- Composites Design & Analysis
- Fluid Mechanics, Stress & Vibration Analysis
- Project Management
- Manufacture & Assembly
- Test & Commissioning



*Roof Mounted
Probe Traverse*

Specification Summary

- Mach 0.3 wind speed
- 3% blockage
- +/- 1 mm positional accuracy
- High modulus carbon composite structure
- High ratio, low backlash, low mass harmonic drives
- Bespoke integral slip rings for power & signals
- Integral pressure transducer
- Real-time laser wind deflection measurement system
- Integrated capacitive collision avoidance system
- Multi-probe type attachment system with integral cabling
- Opto-electronic limit switches
- 3 m x 4 m x 6 m traverse volume



*Floor Mounted
Probe Traverse*