

## Measurement revolution gains new momentum

**Following an extensive preview and testing period, the revolutionary Renishaw REVO™ five-axis measuring head and probe system is being made available commercially to manufacturers worldwide. Incorporating Renishaw's Renscan5™ technology, REVO™ has proven to improve inspection throughput levels by up to 900% on CMMs previously fitted with three-axis scanning systems, whilst also saving hours of calibration times compared to conventional indexing head systems.**



The key to the success of the REVO™ five-axis head is its ability to overcome the limitations of three-axis scanning methods, where any attempt to rapidly move the large mass of a CMM results in inertial errors caused by accelerations and decelerations. Therefore, the only possible way to maintain acceptable accuracy in three-axis scanning has been at the expense of measuring speed. However, REVO™ uses synchronised head and machine motion when scanning, rapidly following changes in part geometry without introducing its own dynamic errors. The CMM is able to move at a constant velocity whilst measurements are being taken, without impacting accuracy.

REVO™ also benefits CMM users with infinite head positioning and innovative tip-sensing probe technology, which further improves measurement accuracy by sensing close to the measured surface. This combination of speed, flexibility and accuracy has proven to give exceptional performance in a wide range of scanning measurement applications, including circle, helix, sweep and gasket scanning, plus, if required, rapid single-touch routines.



Renishaw believes that the REVO™ system fully justifies its revolutionary status, and has highlighted two recent applications from the automotive and aerospace industry where a dramatic step-change in cycle-time performance has been experienced by users.

The first application was the measurement of an aero-engine blisk, requiring nine sectional scans of the airfoil profile, eight longitudinal scans on the blade, two scans of the root profile and finally, one scan on the annulus profile. Originally performed with a three-axis scanning system, the measurement of one blade took 46 minutes, compared to just 4 minutes and 30 seconds with the REVO™ system, an exceptional 922% improvement in throughput.

Almost as dramatic were the results obtained for an automotive cylinder head application which comprised the inspection of twelve valve seats, plus three circular scans on each of the twelve guide bores. With REVO™ scanning the valve seats at 400 mm/second and 50 mm/second on the valve guides, the total measurement time was just 3 minutes and 42 seconds. This compared to the original time of 29 minutes and 13 seconds for the three-axis system, giving the manufacturer a 690% improvement in throughput.

As previously forecast by Renishaw, its REVO™ and Renscan5™ technologies are significantly advancing the capabilities of CMMs, and will continue to revolutionise measurement throughput by reducing high accuracy inspection cycle times.