News release
SEMICON West 2006

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It's about accuracy - latest position feedback encoders to feature at SEMICON West exhibition

Renishaw is highlighting its new range of encoder solutions at the Semicon West exhibition and conference, being held at the Moscone Center, San Francisco, USA, from 10th to 14th July 2006.

Described by organisers SEMI as the world's most comprehensive event devoted to the global supply chain for semiconductor and related microelectronics manufacturing, SEMICON West will feature more than 1,500 exhibiting companies from 25 countries, showcasing the latest developments in semiconductor and related microelectronics manufacturing equipment, materials and services. Renishaw will be located in booth 5329.

The focus for encoder systems will be the expansion of the SiGNUM™ range of high accuracy rotary and linear encoders, a range of miniature magnetic rotary encoders, and high resolution laser interferometer encoders.

The SiGNUM™ family of rotary and linear encoders continues Renishaw's reputation for delivering encoders that offer ruggedness and precision, resulting in levels of performance previously possible only from fine-pitch systems too delicate for many industrial roles.

The SiGNUM™ encoder range offers high accuracy, resolution and repeatability with high speed, high operating temperatures, ultra-low cyclic error (<±40 nm) and innovative *IN-TRAC*™ optical reference mark, which remains phased over the entire speed and temperature specification. The system offers intelligent signal processing, ensuring excellent reliability, whilst comprehensive SiGNUM™ software enables optimum set-up and real-time system diagnostics via a PC's USB port.

The RELM high accuracy linear scale is an exciting new addition to the SiGNUM™ range, comprising the SR readhead, Si interface and 20 micron pitch RELM scale, which is offered in defined lengths. Manufactured from stabilised Invar, which provides a low thermal expansion of ~0.6 micron/m/°C (0 °C to 30 °C), the RELM scale is offered with a choice of *IN-TRAC*™ reference mark positions and dual optical limits. The robust yet highly precise 20 µm RELM scales are offered in defined lengths with custom lengths available on request. With accuracy better than ±1 µm and resolution to 20 nm, RELM satisfies the most demanding precision motion requirements.

The SiGNUM™ RESM angle encoder is a one-piece stainless steel ring with 20 micron scale graduated directly on to the periphery. Featuring the *IN-TRAC*™ optical reference mark, which repeats, regardless of direction, at operational speeds of over 4,500 rev/min (52 mm diameter), and up to 85 ° C, the RESM offers outstanding accuracy, with ±0.5 arc second graduation accuracy on a 417 mm ring. It is also extremely compact and easy to install as Renishaw's patented taper mount providing active adjustment to minimise installation errors and simplify integration, whilst the large internal diameter simplifies the routing of cables and pneumatic supplies through the machine.

SEMICON West visitors will also witness exciting SiGNUM™ new rotary developments including the Si-FN interface, which provides FANUC serial communications direct from the encoder, the DSi (Dual SiGNUM™ interface), and the REXM ultra high accuracy ring encoder.

The DSi combines two SiGNUM™ SR readheads on an RESM ring for very high accuracy with an angularly repeatable and customer located propoZ™ reference position, which is completely unaffected by bearing wander or switch-off. For ultimate precision, DSi combined with the ultra-high accuracy REXM ring offers better than ±1 arc second total installed accuracy.

A powerful component of Renishaw's new SiGNUM™ family of rotary and linear encoders is the PC-based SiGNUM™ software that provides comprehensive calibration, set-up optimisation and real-time diagnostics. The SiGNUM™ Si interface is connected to the PC via a USB connector and offers a range of features and benefits, including real time signal monitoring, readhead pitch adjustment, calibration of the encoder reference mark and incremental signals, remote system monitoring and advanced error logging. The result is both simplified installation of the encoder system and on-going system maintenance, further enhancing a rugged encoder range that delivers levels of performance previously possible only from fine-pitch systems too delicate for many industrial roles.

Meeting demand for reliable, low-cost, high-speed rotary encoders, Renishaw's miniature magnetic rotary encoders provide class-leading performance along with ruggedness and durability. SEMICON West visitors will see that the magnetic encoders are available in component, modular and packaged shaft-style models. The RM family of magnetic encoders offers up to 8,192-count positioning resolution and operating speeds to over 30,000 rev/min.

Non-contact magnetic design eliminates seals, bearings and moving parts for lifetime reliability. Standard models provide excellent shock and vibration resistance, while optional sealed models allow application in harsh environments and even immersion. Low cost, compact size and design simplicity enable use in a wide range of industries.

In addition to the comprehensive range of non-contact position encoders, Renishaw also offers a laser interferometer based feedback solution - the RLE. The simple, unique architecture of the RLE system is achieved using a fiber optic laser delivery system that enables the laser beam to be delivered directly to the measurement axis. This direct delivery greatly simplifies optical path complexity, eliminating the requirement for multiple beam benders, splitters and mounts, providing a system that can be installed in minutes, with a smaller footprint and at lower costs.

The RLE system comprises only two main components: the RLU laser unit and the RLD detector head. Laser units are available with single or dual axis capability, whilst detector heads are available in a range of interferometer configurations to ensure the optimum solution for every application.

With laser frequency stability of 2 ppb, and resolutions to 38.6 picometers (when using a plane mirror or differential interferometer configuration and an optional RPI20 parallel interface), the RLE system is ideal for applications such as e-beam lithography, laser writers, mask, wafer and LCD inspection.

For non-vacuum applications, the optional RCU10 real-time quadrature compensation system enables positional accuracy of 1 ppm (1 µm/m) over a wide range of environmental conditions.

The SEMICON West exposition will offer an extensive schedule of programs and events to facilitate increased networking and collaboration within the global semiconductor community. In 2005, more than 40,000 people registered for the show, making it the largest microelectronics technology exposition in North America.