

New encoder catalogue includes high accuracy linear scale and magnetic rotary encoders

Renishaw offers a wide range of compact optical and magnetic encoder systems to meet the diverse requirements of industrial automation. The company's latest encoder product catalogue features Renishaw's full range of linear, angle, magnetic and laser encoders.

New additions include the new RELM high accuracy linear scale, a range of high-performance ultra-high-vacuum (UHV) encoders, high resolution laser interferometer encoders, and full details of improvements in speed, resolution and reliability to Renishaw's standard optical encoder lines of RG2 and RG4 linear encoders.

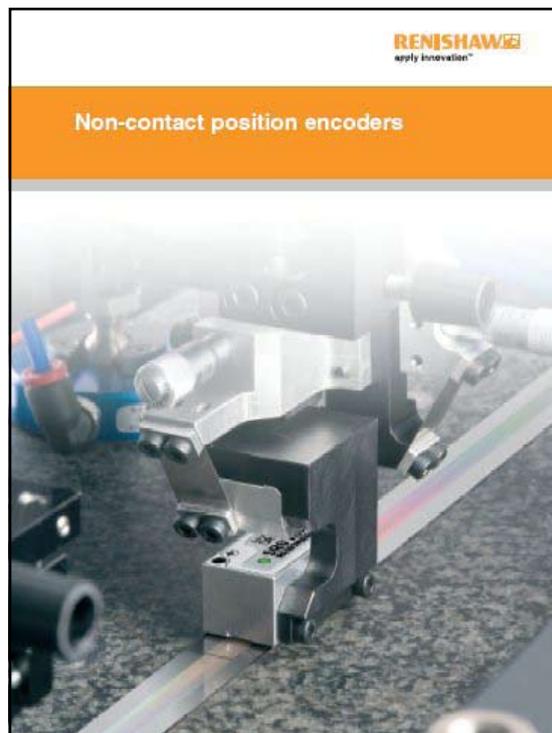
The latest offerings further consolidate Renishaw's position as a global leader in micron, nanometer and picometer position feedback systems for many applications from lab and medical instruments, and semiconductor manufacturing equipment, to machine tools, metrology systems, and massive aerospace assembly machines.

Proven in thousands of installations across the spectrum of precision machines and instruments, Renishaw's optical encoders were created to bring high precision, speed and reliability to demanding environments and tough industrial applications. Innovative metal scales avoid the fragility of glass encoders, while unique non-contact readheads and filtering optics avoid the bulkiness, hysteresis and wear of traditional industrial encoders.

A new SiGNUM™ family of rotary and linear encoders applies that same formula of ruggedness and precision to deliver levels of performance previously possible only from

fine-pitch systems too delicate for many industrial roles.

The new SiGNUM™ encoder range offers high accuracy, resolution and repeatability with high speed, high operating temperatures, ultra-low cyclic error (typically $<\pm 40$ 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 SiGNUM™ RELM high accuracy linear encoder comprises the SR readhead, Si interface and 20 micron RELM scale, which is offered in defined lengths. Initially

available in Invar, which provides a low thermal expansion of 1.4 micron/m/°C, the RELM scale is offered with a choice of *IN-TRAC*[™] reference mark positions and dual optical limits. Together with the robust, yet highly precise 20 micron spars, this enables the RELM to offer accuracy to ±1 micron and resolution to 20 nm, satisfying the most demanding precision motion requirements.

The SiGNUM[™] RESM angle encoder is a one-piece stainless steel ring with 20 micron scale marked directly on the periphery. It features 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.

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. The magnetic encoders are available in component, modular and packaged shaft-style models, including the RM family of magnetic encoders which offers up to 4,096-count positioning resolution, accuracy to 0.3 °, 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.

Renishaw's unique RLE fiberoptic laser interferometer encoders deliver interferometer-based nanometer positioning accuracy from a remote laser source - even to two axes. New detector head choices (six in all) allow careful matching to a wide range of application requirements, including capability for picometer-level resolutions.

The fiberoptic beam delivery greatly reduces optical path complexity, saves space on miniature machines, and keeps heat of the laser from affecting measurement axes. Simple 'bolt down/dial in' laser alignment enables ease of installation comparable to traditional tape- or glass-based encoders.

Applications include X-Y stages, fiberoptic alignment machines, glass grinding machines, photomask machines, and other precision motion systems. An optional real-time compensation system enables positional accuracy of 1 ppm (1 micron/m) in a wide range of environmental conditions.

Technology note

Renishaw's optical encoder systems are based on an innovative non-contact optical arrangement which provides zero mechanical hysteresis and excellent metrology, yet can withstand a variety of contaminants such as dust, light oils and scratches without compromising the signal's integrity. This ensures customers' machines run reliably with little or no maintenance.

In addition to these benefits, all Renishaw's encoders have an established reputation for being easy to install and set up. Scale is available in many lengths with special formula self-adhesive backing, removing the need for drilling and tapping, saving time and money.

All optical readhead and interface combinations feature a patented set-up LED which speeds installation and removes the need for complex set-up equipment or oscilloscopes.

Renishaw encoder systems are used in all sectors of industrial automation such as semiconductor, electronics, medical, scanning, printing, scientific research, space research, photography, specialist machine tools, including precision metrology and motion systems.