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## News from Renishaw

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### Renishaw expands range of encoders for Functional Safety

Renishaw, the global engineering technologies company, builds on its existing functionally safe (FS) portfolio by introducing two new encoders for both linear and rotary applications — RESOLUTE™ FS with BiSS® Safety absolute open optical encoder system, and TONiC™ FS incremental open optical encoder system.



The RESOLUTE Functional Safety (RESOLUTE FS) optical absolute encoder is based on the design of the award winning RESOLUTE series with elements redesigned to meet FS safety standards.

The TONiC Functional Safety (TONiC FS) optical encoder combines full FS compliance with the exceptional metrology performance, ultimate reliability and other benefits of the established TONiC encoder range.

Both the RESOLUTE FS BiSS Safety encoder and the TONiC FS encoder are certified to ISO 13849 Category 3 PLd, IEC 61508 SIL2 and IEC 61800-5-2 SIL2.

Full FS certification is required to guarantee the safe use of functions that include safe stops 1 and 2, safe operating stop (SOS) and safe limited speed (SLS) — all of which require functionally safe encoder feedback. RESOLUTE FS encoders are compatible with the open source BiSS Safety serial communications protocol and Siemens' Drive-CLiQ protocol. TONiC FS encoders are available with the TONiC Ti-000 analogue interface and Dual Output (DOP) interface options.

### About RESOLUTE encoders

Renishaw's RESOLUTE encoder is the world's most advanced single-track true-absolute optical encoder system delivering up to 1 nanometre resolution, superior long-term reliability, instant operation after power-up without reference return and high-speed metrology at speeds up to 100 m/s.

The RESOLUTE series is ideal for advanced motion control applications and enables smooth velocity control with Sub-Divisional Error (SDE) of  $<\pm 40$  nm and excellent positional stability via jitter (noise) of  $<10$  nm RMS. The advantages of open-absolute encoders over enclosed designs include large through-hole rotary (angle) ring scales for easy design-in, low inertia and low-profile components and the absence of wear associated with contacting parts. Furthermore, RESOLUTE encoders offer easy installation as a result of generous set-up tolerances and an integral set-up LED, excellent dirt immunity and IP64 sealing, giving outstanding performance even on the long axes typical of heavy industrial applications.

## **About TONiC encoders**

Renishaw's TONiC encoder is designed for highly-dynamic precision motion systems, enabling better accuracy, higher speed and greater reliability in a wide variety of demanding industry applications.

TONiC readheads incorporate Renishaw's market-proven third generation filtering optics, which is further enhanced by dynamic signal processing including Auto Gain Control and Auto Offset Control. The result is low Sub-Divisional Error (SDE) and low noise (jitter), giving smooth velocity control for improved scanning performance and increased positional stability.

Renishaw will be exhibiting its encoder product ranges at SPS IPC Drives Nuremberg (Germany) from 26–28 November 2019. Please visit stand 231 in Hall 4A to talk to our expert sales and technical staff about functionally safe encoders and your metrology needs.

For further information on functionally safe encoders, visit [www.Renishaw.com/FSencoders](http://www.Renishaw.com/FSencoders)

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