**Functional safety version of the HEIDENHAIN ECA 4000**

When using torque motors in machine tools, it is often necessary to classify the encoders for safety-related applications according to SIL 2 (as per EN 61 508) or performance level "d" (as per EN ISO 13849), because the rotational axes are usually operated with only one encoder. Functional safety versions of the EC 4000 modular angle encoders with bidirectional EnDat 2.2 interface in combination with a safe control can be used as single-encoder systems.

In addition to the data interface, however, the mechanical connection of the encoders is also relevant to safety. The verification of a safe mechanical connection can be very costly for the machine tool builder. With the functional safety version of the ECA 4000 absolute modular angle encoder, HEIDENHAIN makes this verification considerably easier. This is because the mechanical fault exclusion of the ECA 4000 for safety-related applications has been confirmed for a wide range of applications within the framework of a type examination and is therefore ensured under all specified operating conditions. For example, the material and surface characteristics of the shaft and flange components, screw lengths, screw locking devices, tightening torques, etc. are defined.

The ECA 4000 modular angle encoder is available in a wide selection of diameters and in two scale drum shapes. The drum shape of the ECA 4400 is centered and fixed on the mating shaft by means of an interference fit. If no mechanical error is required for the safety design, the interference fit is not required. In this case, the highly accurate drum shape of the ECA 4402 can also be used with three-point centering. A mounting wizard in conjunction with the PWM 20 phase meter enables easy and safe commissioning, e.g. by inspecting the correct diameter combination of the scanning head and the scale drum. With the EIB 2391S external interface box, the ECA 4000 devices can also be used in safety-related applications with a DRIVE-CLiQ \* interface.

\*DRIVE-CLiQ is a registered trademark of SIEMENS AG.

*For more information, visit:* [*www.heidenhain.de*](http://www.heidenhain.de/)

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*For safety-related applications: The functional safety version of the ECA 4000 absolute angle encoder has a centering collar on its inside diameter*