

Eddy current sensors

ADVANCES IN EDDY CURRENT SENSOR TECHNOLOGY ARE STREAMLINING PRODUCTION, IMPROVING PERFORMANCE AND INCREASING THE AMOUNT OF AVAILABLE CUSTOMIZATION

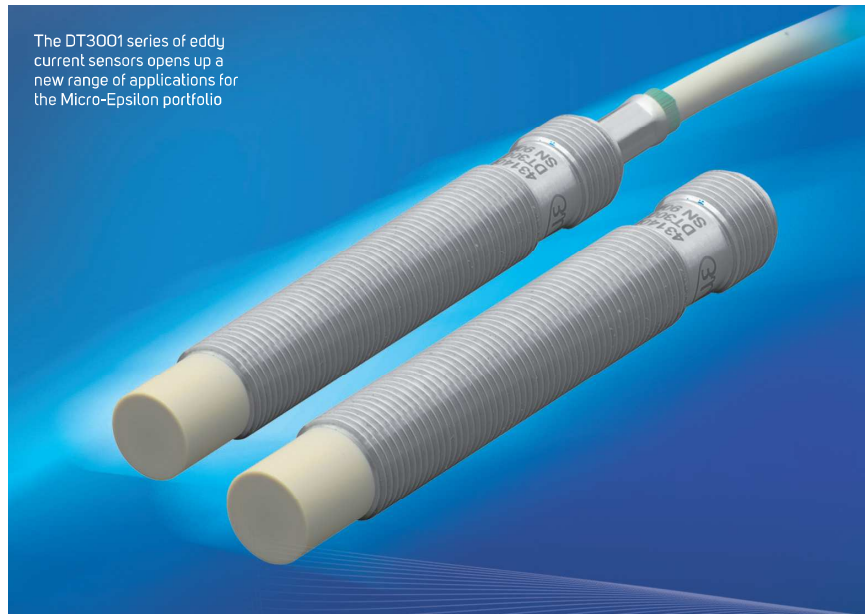
As well as the miniaturization and increasing functionality of non-contact displacement sensors based on electromagnetic measuring principles, smooth process integration is also a decisive factor in highly automated industrial production environments.

In addition to tactile (gauging) sensors, non-contact metrology is now also used to measure displacement, deformation, stretching, distances, position and other geometrical shapes and sizes. These sensors often measure faster, more accurately and more reliably than tactile sensors. The measurement data is normally available in real time to automatically regulate and control the production. Quality control is not only carried out on finished products, but metrology can also supervise and optimize production processes. The aim is to improve product quality, reduce rejects to a minimum and to lower total production costs.

The new eddyNCDT 3001 is a cost-effective eddy current sensor with housing that has, to date, been reserved only for inductive sensors and proximity sensors. This compact sensor comes with integrated electronics, including temperature compensation, and offers an excellent price-to-performance ratio, as well as easy operation. The high measurement accuracy and linearity, as well as the high frequency response rate of 5kHz, are outstanding, compared with other sensors in the same price class. The sensors are factory-calibrated for ferromagnetic and non-ferromagnetic materials, and boast a measuring range of 4mm. The sensors are protected to IP67. Because the sensors are easy to use and cost-effective, they are particularly suitable for standard production in OEM applications. The new DT3001 series opens up new application fields for the Micro-Epsilon product range based on the eddy current principle.

Eddy current sensors from Micro-Epsilon measure displacement, distance, position,

The DT3001 series of eddy current sensors opens up a new range of applications for the Micro-Epsilon portfolio



oscillations, vibrations and so on. Non-contact eddy current sensors offer extremely precise measurements where sub-micron accuracy is required. Modifications to the standard eddy current sensors are often required, particularly for mid-size and large series. What can be modified? Sensors can be adapted in many different ways to suit customer-specific applications – for example, changes can be made to the cable, sensor material and design, and to the controller. Customized sensors can be produced efficiently, which results in considerable cost reductions. For example, sensors with integrated electronics in a miniature housing or special sensor designs are often requested by systems integrators.

Examples of customized modifications are modified offset and measuring range; housing and mounting options for the sensor; sensors that are pressure-resistant up to 2,000 bar; miniaturized sensors; various materials for coil,

housing and circuit boards; individual cable lengths; and specific target calibrations.

Micro-Epsilon has been developing and manufacturing its own eddy current sensors since 1980. During this time, the technology has been continuously improved and adapted to new requirements. In terms of sensor miniaturization, the company's 2.4mm diameter sensor is unrivaled. The development efforts have taken conventional sensors to their physical limits. A new technology, therefore, had to be found – one that made the sensors suitable for new applications. Research conducted over recent years has led to the development of a printed coil embedded in an inorganic carrier material. Thanks to recent material and technological developments, a path has been paved for the new ECT process. The material requirements for the carrier material are that it must not be metallic, nor may it emit gas. It also needs to have a low coefficient of expansion. ◻