

Reference guide includes largest choice of current sensors in world today

A guide is available from sensor manufacturer Micro-Epsilon on the company's non-contact, wear-free eddy current displacement sensors.



With the largest choice of custom and standard eddy current sensors in the world today, Micro-Epsilon has now brought together the 28 most common variants of its eddy NCDT sensor range and combined them into an easy-to-use reference guide for its customers.

Eddy current displacement sensors measure distances, displacement or position of any electrically conductive target. Micro-Epsilon's eddy NCDT range offers a number of advantages for the user, including very stable measurements, high resolution and linearity, excellent temperature range and stability, high measurement rates and are sealed to IP67. Unique to the eddy NCDT range is Micro-Epsilon's patented 'active temperature compensation' feature and field calibration capability.

Eddy current principle

The eddy current measurement principle is an inductive measuring method based on the extraction of energy from an oscillating circuit. This energy is required for the induction of eddy currents in electrically conductive materials.

A coil is supplied with an alternating current, which causes a magnetic field to form around the coil. If an electrically conducting object is placed in this magnetic field, eddy currents are induced, which forms an electromagnetic field according to Faraday's Induction Law. This field acts against the field of the coil, which also causes a change in the impedance of the coil. The controller calculates the impedance by considering the change in amplitude and phase position of the sensor coil.

Micro-Epsilon's [eddy NCDT 3300](#), (pictured above), is ideal for harsh ambient conditions or where maximum precision is required. Various sensor models are available which cater for all application requirements. For example, the miniature eddy NCDT range uses variable coil geometry and innovative production technologies in order to offer customers a sensor that has installation dimensions of less than 2mm.

Pressure-resistant versions are available up to 2000 bar. Operating temperatures are from -50°C up to 235°C and robust, IP67 versions are also available. An active sensor, controller and cable compensate for temperature fluctuations, offering extreme temperature stability of 0.015%/°C. Measurement ranges are from 0.4mm up to 80mm, linearity is 0.2% and resolution is 0.01% of the measurement.

The eddy [NCDT 3300](#) measurement system consists of a sensor, sensor cable and a controller with adaptor board. This design means it is possible for the user to operate all eddy NCDT sensors with only one controller. The adaptor board represents a link between sensor, cable and the electronics. The sensor type used, the cable length and the target material are stored on this board. It adapts the various sensors to the oscillator and demodulator standard circuits and also contains the settings for temperature compensation. When changing or replacing a sensor, only the sensor, sensor cable and adaptor board need to be replaced. The adaptor board also enables the user to easily adapt the sensor for different applications, for example, if the target material, size or shape changes.

A new controller is now available that enables the user to synchronise the system for multi-channel applications. The [MCT304](#) multi-channel platform is available for thickness and displacement measurements with up to four channels. Up to four controllers can be integrated in a single MCT platform. The platforms can be synchronised with each other, whereby the simultaneous operation of any number of eddy NCDT sensors is possible. In order to compensate for opposing sensor influences, the systems are synchronised by means of a master/slave synchronisation cables.

Potential applications for the eddy [NCDT 3300](#) include automotive inspection systems, tensile strength testing in steelworks, measuring the thickness of foil, compressor/turbine gap, shaft displacement and edge control. In automotive Research & Development, the miniature sensors are used extensively. Applications include measurement of valve stroke, injection needle movement, cylinder head breathing, lubricating gap, oil film thickness, crankshaft concentricity and axial movement of the crankshaft.



Infrared sensor that is ideal for in-process temperature measurement

A unique, non-contact infrared temperature sensor is available from Micro-Epsilon, which is ideal for measuring the temperature of glass products and surfaces during production, as well as glass substrates used in semiconductor processing and for the manufacture of solar cell panels.

The [Optris CT glass](#), (pictured on the left), infrared thermometer, developed by Micro-Epsilon uses a 5.2µm wavelength detector to accurately measure temperatures from 100°C up to 1,650°C of glass surfaces or products, including solar panels, flat glass lines, light bulbs, car glass finishing and glass containers. Further information on this product and the Reference Guide can be obtained from Micro-Epsilon at the address below.

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