MICRO-EPSILON

More Precision.

eddyNCDT 3300

Non-contact eddy current sensors

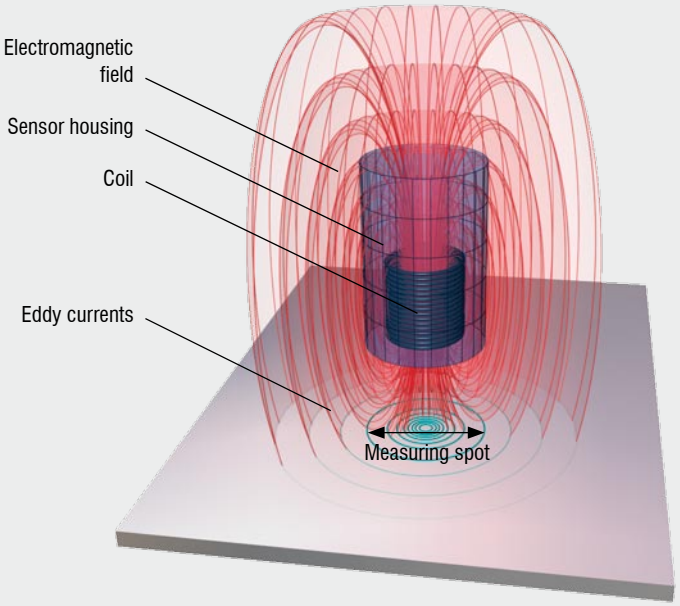
- **Non-contact and wear-free measurement**
- **Different sensor types**
- **Nanometre resolution**
- **Robust sensor construction for harsh environments**
- **Frequency response up to 100kHz (-3dB)**

For many years, Micro-Epsilon has been a pioneer in displacement measurement using eddy current technology. The eddyNCDT 3300 eddy current measuring system, for example, is considered to be one of the most powerful displacement measurement systems in the world today. Due to a mature technical design, the system offers numerous benefits to customers in multiple application areas.

Measuring principle

The eddy current principle occupies a unique position amongst inductive measuring methods. The measuring principle is based on the extraction of energy from an oscillating circuit. This energy is required for the induction of eddy currents in electrically-conductive materials. Here, a coil is supplied with an alternating current, causing a magnetic field to form around the coil. If an electrically conducting object is placed in this magnetic field, eddy currents are induced which form a 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 impedance can be calculated by the controller by looking at the change in the amplitude and phase position of the sensor coil.

Principle



Stability and robustness with maximum precision: eddyNCDT eddy current sensors

Eddy current sensors from Micro-Epsilon are often used in applications where harsh ambient conditions are present and where maximum precision is required. The resistance to high pressure and extreme temperature is also critical. The many designs of eddy current sensor enable engineers to select the optimal sensor for their particular application.

Miniaturised sensors

Because of its variable coil geometry and innovative production technologies, miniature eddyNCDT sensors have housing dimensions of just a few millimetres.

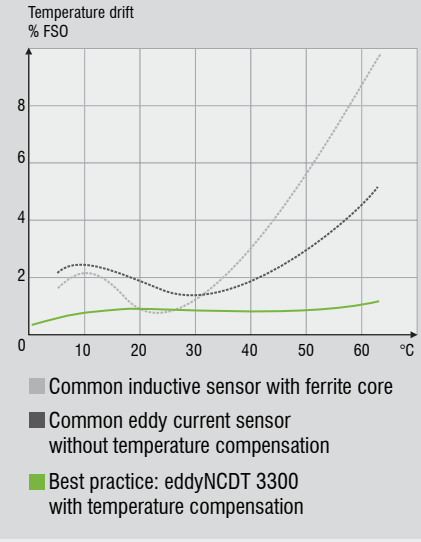
The most important sensor benefits at a glance

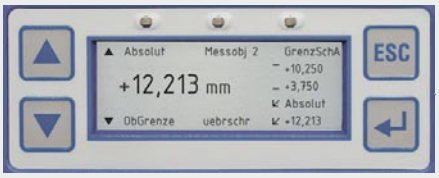
- Pressure-resistant versions up to 2,000 bar
- Temperature resistance from -40 to 200°C (other temperature ranges on request)
- Miniature sensors with installation sizes of less than 2mm
- Robust and resistant IP67 versions

Ideal for temperature fluctuations

- Active sensor, cable and controller temperature compensation
- Extreme temperature stability of just 0.015% / °C

Temperature drift by comparison





Quadruple limit switch

- Two freely definable minimum and maximum limit values
- Individual switching threshold
- LED display for upper and lower limit warnings

Automatic calibration

- Three-point linearisation for optimum onsite calibration

Four configurations can be stored

- Factory calibration and three individual configurations can be stored
- Simple microprocessor-controlled singlecycle calibration

Ideal for fast measurements

- Frequency response 25kHz or 100kHz (-3 dB)

Types of output

- Voltage / current
- Metric / inch and graphical display
- Display of auto-zero, peak-to-peak value, minimum, maximum
- Scalable display for conversion to indirect measured values

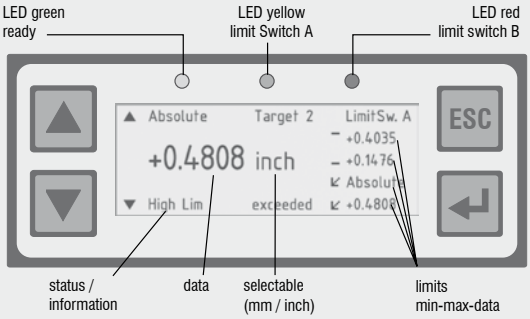
Multifunctional controller

The eddyNCDT 3300 system includes high-performance processors for reliable signal conditioning and further processing. The innovative three-point linearisation technique it uses enables almost completely automatic linearisation which makes possible the optimum accuracies for every metallic measuring object and every installation environment. Operation is supported by an illuminated LC graphical display and on-screen prompts.

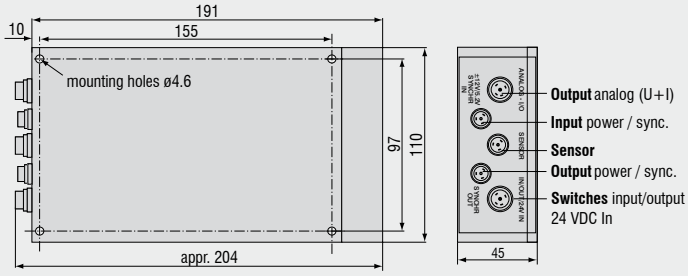
Functions overview

- Microprocessor-supported linearisation
- Dialogue-supported fourbutton operation
- Numeric / graphical measured value display
- Measured value display
- Freely configurable limit values
- Calibration settings
- Basic settings
- System information
- Filter options 25Hz, 2.5kHz, 25kHz

Multifunction controller

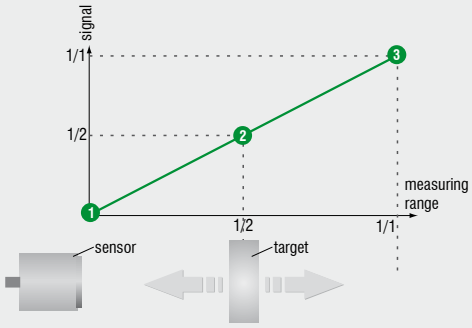


Controller dimensions



Linearisation and calibration

Systems in the eddyNCDT 3300 series can be individually linearised and calibrated by the user. Therefore, optimum measurement accuracies will always be achieved, even in the case of failed measuring object materials or harsh ambient conditions. The adjustment is made using three distance points (①,②,③) which are defined by a reference standard.



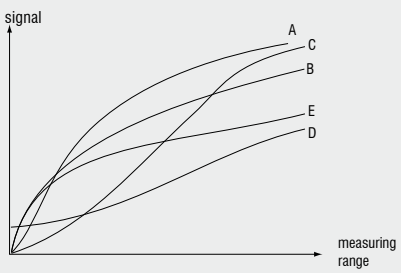
3-point linearisation

Maximum precision due to field calibration

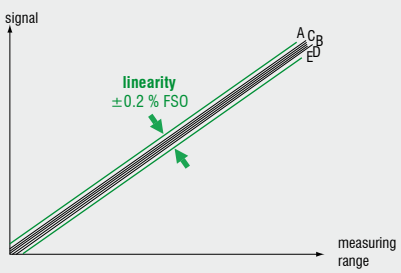
In order to achieve maximum precision, eddyNCDT 3300 provides the field calibration function for achieving extremely precise measurement results. The following influences are taken into account:

A: Different target materials
B: Different target sizes (measuring spot)
C: Target shape
D: Side preattenuation
E: Target tilt angle

The measuring range can also be extended using the field calibration.



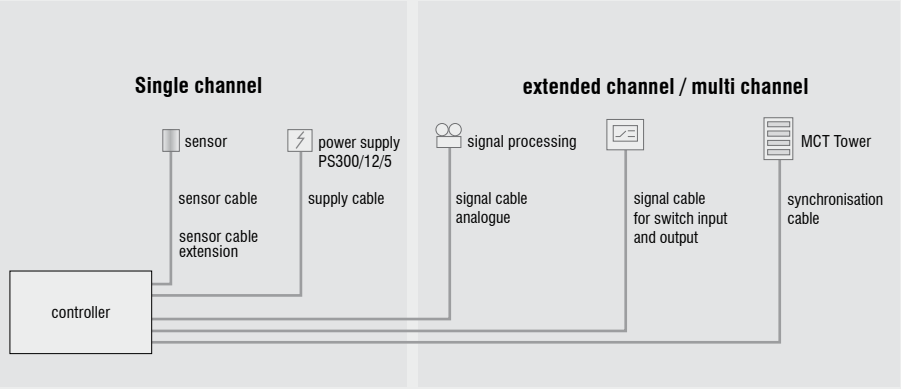
Common sensor without field calibration
Massive linearity deviation results from the different influences



Best practice:
eddyNCDT 3300 with Micro-Epsilon field calibration
High accuracy though compensation of the influences

System design:
A single measurement channel comprising
- one sensor
- the sensor cable
- one adaptation board
- one controller
- the power supply
- and the signal cable

Cables and accessories for signal further processing and synchronisation are available for extended measurement channels (see pages 11 / 16).



synchronisation 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 eddyNCDT sensors is possible. In order to compensate for opposing sensor influences, there are synchronisation inputs and outputs.

Fast sensor replacement by changing the adaptation board
The eddyNCDT 3300 measurement system consists of a sensor, the sensor cable and the controller with adapter board. This design makes it possible to operate all eddyNCDT sensors with only one controller.
The adapter board represents the 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 replacing or changing a sensor, only the sensor, sensor cable and adapter board need to be replaced.

All data refer to eddyNCDT sensors in combination with controller DT330x and relate to the particular sensor measuring range.

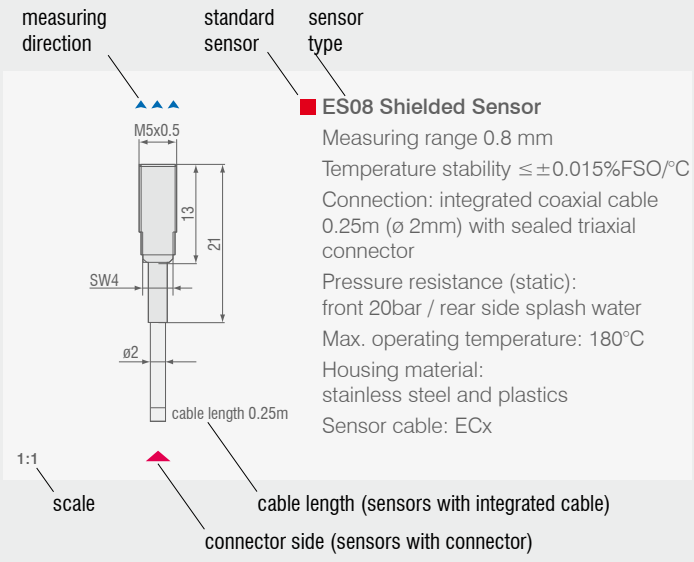
Controller	model	DT3300	DT3301
	power supply	±12VDC / 100mA, 5.2VDC / 220mA [1]	11 - 32VDC / 700mA
Measuring ranges	mm	0.4 / 0.5 / 0.8 / 1 / 2 / 3 / 4 / 6 / 8 / 15 / 22 / 40 / 80	
Offset		~ 10% FSO	
Linearity		≤±0.2% FSO	
Resolution [2]	up to 25Hz	≤0.005% FSO (≤0,01 % FSO with measuring ranges 0.4 and 0.5 mm)	
	up to 2.5kHz	≤0.01% FSO	
	up to 25 / 100kHz	≤0.2% FSO	
Frequency response		25kHz / 2.5kHz / 25Hz (-3 dB) selectable 100kHz for measuring ranges ≤1mm	
Temperature compensation		10 ... 100°C (option TCS: -40 ... 180°C)[3]	
Temperature range	sensors / cable	-40 ... 200°C (details see sensor description)	
	controller	5 ... 50°C	
Temperature stability	sensors	≤±0.015% FSO/°C / ≤±0.025% FSO/°C (see sensor description)	
Sensor cable length		3m (±0.45m) - optional up to 15m	
Signal output		selectable 0 ... 5V; 0 ... 10V; ±2.5V; ±5V; ±10V (or inverted); 4 ... 20mA (load 350 ohm)	
Electromagnetic compatibility		acc. to EN 50081-2 / EN 61000-6-2	
Controller functions		limit switches, auto-zero, peak-to-peak, minimum, maximum, average, storage of 3 configurations (calibrations)	

FSO = Full Scale Output
Reference material: Aluminum (non-ferromagnetic) and Mild Steel DIN 1.0037 (ferromagnetic)
Reference temperature for reported data is 20°C (70°F); Resolution and temperature stability refer to midrange
Data may differ with magnetic inhomogen material.
[1] additional 24VDC for external reset and limit switch
[2] resolution data are based on noise peak-to-peak values
[3] temperature stability may differ with option TCS

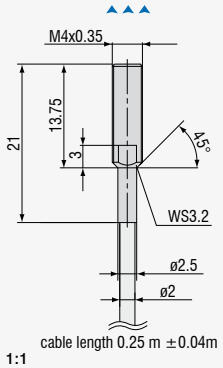
Tips for selecting the correct sensor

The respective characteristics must be taken into account when selecting the correct sensor from the various models available. The designations and symbols used are explained in the diagram opposite.

- **Standard sensor:** Models that are characterised by high temperature stability, standard mounting options and proven design.
- **Measurement direction:** The measurement is made in this direction
- **Connector side:** with plug-in connection (for sensors with plug connectors)



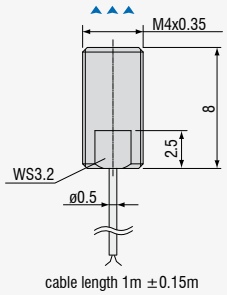
■ Standard sensor ▲▲▲ Measurement direction ▲ Connector side



1:1

■ ES04 Shielded Sensor

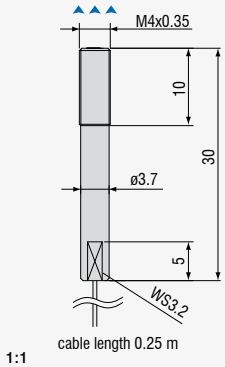
Measuring range 0.4mm
Temperature stability ≤±0.015%FSO/°C
Connection: integrated coaxial cable 0.25m (±0.04m) (ø 2mm) with sealed triaxial connector
Pressure resistance (static): front 100bar / rear side splash water
Max. operating temperature: 150°C
Housing material: stainless steel
Sensor cable: ECx, length ≤6m



2:1

ES04/180(25) Shielded Sensor

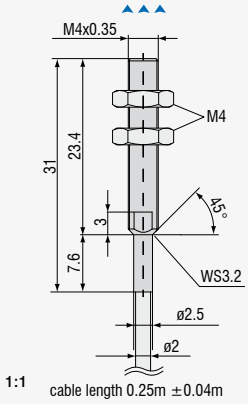
Measuring range 0.4mm
Temperature stability ≤±0.025%FSO/°C
Connection: integrated coaxial cable 1m (ø 0.5mm), short silicon tube at cable exit
Pressure resistance (static): front 100bar
Max. operating temperature: 180°C
Housing material: stainless steel
Sensor cable: ECx/1 or ECx/2, length ≤6m



1:1

ES04/180(27) Shielded Sensor

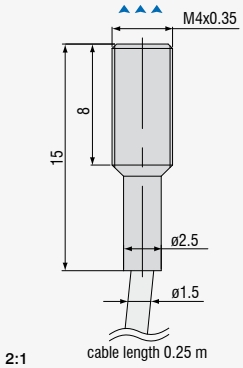
Measuring range 0.4mm
Temperature stability ≤±0.025%FSO/°C
Connection: integrated coaxial cable 0.25m (ø 0.5mm) with solder connection board
Pressure resistance (static): front 100bar
Max. operating temperature: 180°C
Housing material: stainless steel
Sensor cable: ECx/1, length ≤6m



1:1

ES04(34) Shielded Sensor

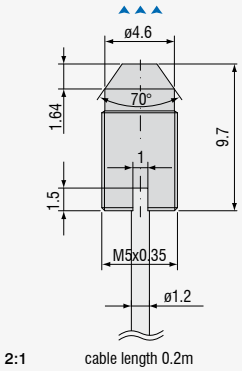
Measuring range 0.4mm
Temperature stability ≤±0.025%FSO/°C
Connection: integrated coaxial cable 0.25m (ø 2mm) with sealed triaxial connector
Pressure resistance (static): front 100bar / rear side splash water
Max. operating temperature: 150°C
Housing material: stainless steel and ceramic
Sensor cable: ECx, length ≤6m



2:1

ES04(35) Shielded Sensor

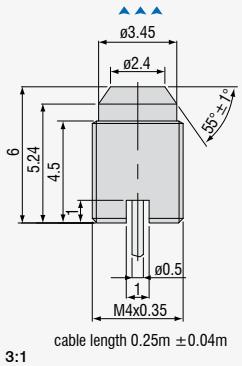
Measuring range 0.4mm
Temperature stability ≤±0.025%FSO/°C
Connection: integrated coaxial cable 0.25m (ø 1.5mm) with sealed triaxial connector
Pressure resistance (static): front 100bar / rear side 5 bar
Max. operating temperature: 150°C
Housing material: stainless steel and ceramic
Sensor cable: ECx/1, length ≤6m



2:1

ES04(44) Shielded Sensor

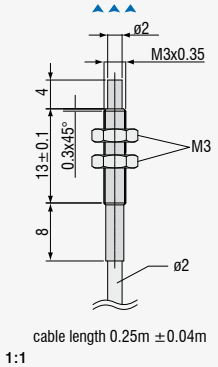
Measuring range 0.4mm
Temperature stability ≤±0.025%FSO/°C
Connection: integrated coaxial cable 0.2m (ø 1.2mm) with sealed triaxial connector
Pressure resistance (static): front 100bar / rear side splash water
Max. operating temperature: 150°C
Housing material: stainless steel and ceramic
Sensor cable: ECx, length ≤6m



3:1

ES04(70) Shielded Sensor

Measuring range 0.4mm
Temperature stability ≤±0.025%FSO/°C
Connection: integrated coaxial cable 0.25m (ø 0.5mm) with solder connection board
Pressure resistance (static): front 100bar / rear side splash water
Max. operating temperature: 150°C
Housing material: stainless steel and ceramic
Sensor cable: ECx/1, length ≤6m

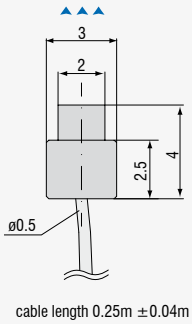


1:1

■ EU05 Unshielded Sensor

Measuring range 0.5mm
Temperature stability ≤±0.015%FSO/°C
Connection: integrated coaxial cable 0.25m (ø 2mm) with sealed triaxial connector
Max. operating temperature: 150°C
Housing material: stainless steel and ceramic
Sensor cable: ECx, length ≤6m

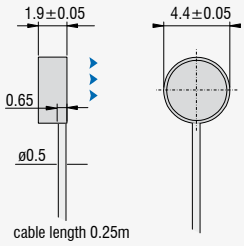
Standard sensor | Measurement direction | Connector side



EU05(10) Unshielded Sensor

Measuring range 0.5mm
Temperature stability ≤±0.025%FSO/°C
Connection: integrated coaxial cable 0.25m (ø 0.5mm) with solder connection board
Max. operating temperature: 150°C
Housing material: stainless steel and ceramic
Sensor cable: ECx/1, length ≤6m

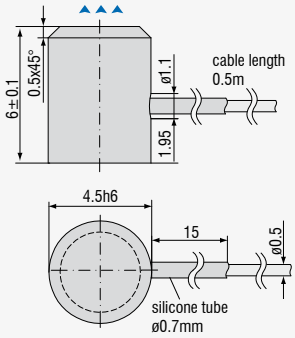
3:1



ES05/180(16) Shielded Sensor

Measuring range 0.5mm
Temperature stability ≤±0.025%FSO/°C
Connection: integrated coaxial cable 0.25m (ø 0.5mm) with solder connection board
Max. operating temperature: 180°C
Housing material: stainless steel and epoxy
Sensor cable: ECx/1, length ≤6m

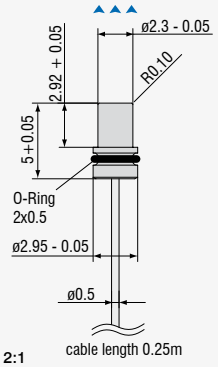
3:1



ES05(36) Shielded Sensor

Measuring range 0.5mm
Connection: integrated coaxial cable 0.5m (ø 0.5mm) with solder connection board
Max. operating temperature: 150°C
Housing material: stainless steel and epoxy
Sensor cable: ECx/1, length ≤6m

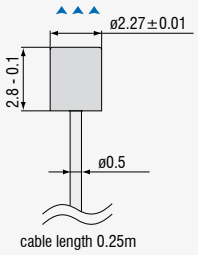
3:1



EU05(65) Unshielded Sensor

Measuring range 0.5mm
Connection: integrated coaxial cable 0.25m (ø 0.5mm) with solder connection board
Pressure resistance (static): front 700bar / rear side splash water
Max. operating temperature: 150°C
Housing material: ceramic
Sensor cable: ECx/1, length ≤6m

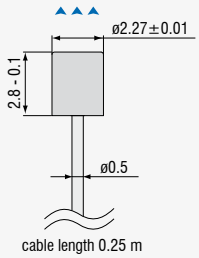
2:1



EU05(66) Unshielded Sensor

Measuring range 0.5mm
Temperature stability ≤±0.025%FSO/°C
Connection: integrated coaxial cable 0.25m (ø 0.5mm) with solder connection board
Pressure resistance (static): front 400bar / rear side splash water
Max. operating temperature: 150°C
Housing material: ceramic
Sensor cable: ECx/1, length ≤6m

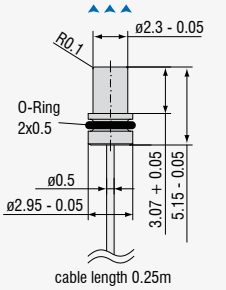
3:1



EU05(72) Unshielded Sensor

Measuring range 0.5mm
Temperature stability ≤±0.025%FSO/°C
Connection: integrated coaxial cable 0.25m (ø 0.5mm) with solder connection board
Pressure resistance (static): front 2000bar / rear side splash water
Max. operating temperature: 150°C
Housing material: ceramic
Sensor cable: ECx/1, length ≤6m

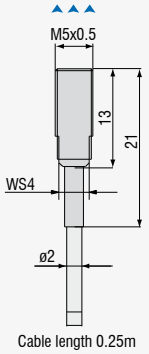
3:1



EU05(93) Unshielded Sensor

Measuring range 0.4mm
Temperature stability ≤±0.025%FSO/°C
Connection: integrated coaxial cable 0.25m (ø 0.5mm) with solder connection board
Pressure resistance (static): front 2000bar / rear side splash water
Max. operating temperature: 150°C
Housing material: ceramic
Sensor cable: ECx/1, length ≤6m

2:1

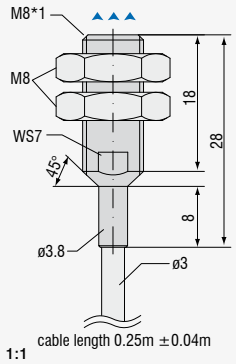


ES08 Shielded Sensor

Measuring range 0.8mm
Temperature stability ≤±0.015%FSO/°C
Connection: integrated coaxial cable 0.25m (ø 2mm) with sealed triaxial connector
Pressure resistance (static): front 20bar / rear side splash water
Max. operating temperature: 180°C
Housing material: stainless steel and plastic
Sensor cable: ECx

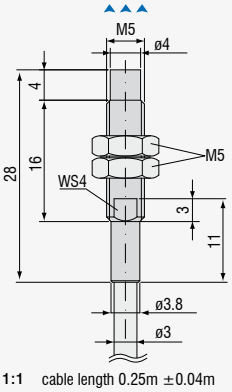
1:1

Standard sensor | Measurement direction | Connector side



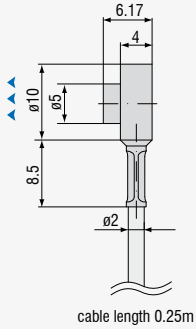
ES1 Shielded Sensor

Measuring range 1mm
Temperature stability ≤ ±0.015%FSO/°C
Connection: integrated coaxial cable 0.25m (ø 3mm) with sealed triaxial connector
Max. operating temperature: 150°C
Housing material: stainless steel
Sensor cable: ECx



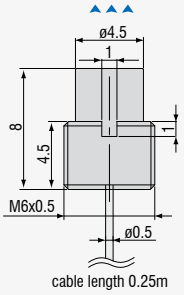
EU1 Unshielded Sensor

Measuring range 1mm
Temperature stability ≤ ±0.015%FSO/°C
Connection: integrated coaxial cable 0.25m (±0.04m) (ø 3mm) with sealed triaxial connector
Max. operating temperature: 150°C
Housing material: stainless steel and plastic
Sensor cable: ECx



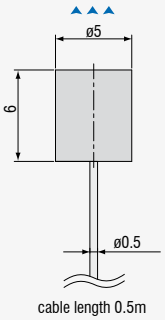
EU1FL Unshielded flat sensor

Measuring range 1mm
Temperature stability ≤ ±0.025%FSO/°C
Connection: integrated coaxial cable 0.25m (ø 2mm) with sealed triaxial connector
Max. operating temperature: 150°C
Housing material: stainless steel and epoxy
Sensor cable: ECx



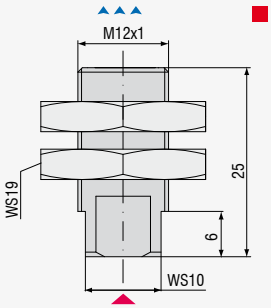
EU1/180(103) Unshielded Sensor

Measuring range 1mm
Temperature stability ≤ ±0.025%FSO/°C
Connection: integrated coaxial cable 0.25m (ø 0.5mm) with solder connection board
Pressure resistance (static): front and rear side 20bar
Max. operating temperature: 180°C
Housing material: stainless steel and plastic
Sensor cable: ECx



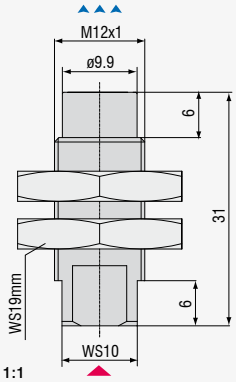
ES1/200 Shielded Sensor

Measuring range 1mm
Temperature stability ≤ ±0.025%FSO/°C
Connection: integrated coaxial cable 0.5m (ø 0.5mm) with solder connection board
Max. operating temperature: 200°C
Housing material: stainless steel and epoxi
Sensor cable: ECx/2
Special assembly references - please request further drawings



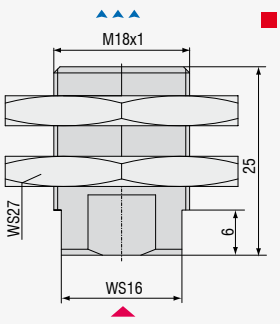
ES2 Shielded Sensor

Measuring range 2mm
Temperature stability ≤ ±0.015%FSO/°C
Connection: sealed triaxial connector
Pressure resistance (static): front 20bar / rear side splash water
Max. operating temperature: 150°C
Housing material: stainless steel and plastic
Sensor cable: Ecx



EU3 Unshielded Sensor

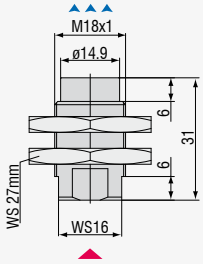
Measuring range 3mm
Temperature stability ≤ ±0.015%FSO/°C
Connection: integrated coaxial cable
Pressure resistance (static): front 20bar / rear side splash water
Max. operating temperature: 150°C
Housing material: stainless steel and plastic
Sensor cable: ECx



ES4 Shielded Sensor

Measuring range 4mm
Temperature stability ≤ ±0.015%FSO/°C
Connection: sealed triaxial connector
Pressure resistance (static): front 20bar / rear side splash water
Max. operating temperature: 150°C
Housing material: stainless steel and plastic
Sensor cable: ECx

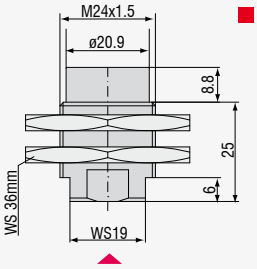
■ Standard sensor ▲▲▲ Measurement direction ▲ Connector side



1:2

■ EU6 Unshielded Sensor

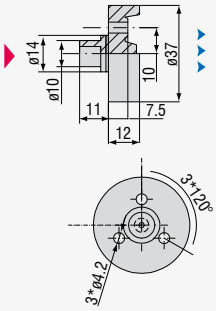
Measuring range 6mm
Temperature stability ≤ ±0.015%FSO/°C
Connection: sealed triaxial connector
Pressure resistance (static):
front 20bar / rear side splash water
Max. operating temperature: 150°C
Housing material:
stainless steel and plastic
Sensor cable: ECx



1:2

■ EU8 Unshielded Sensor

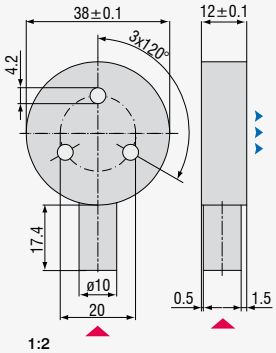
Measuring range 8mm
Temperature stability ≤ ±0.015%FSO/°C
Connection: sealed triaxial connector
Pressure resistance (static):
front 20bar / rear side splash water
Max. operating temperature: 150°C
Housing material:
stainless steel and plastic
Sensor cable: ECx



1:3

■ EU15 Unshielded Sensor

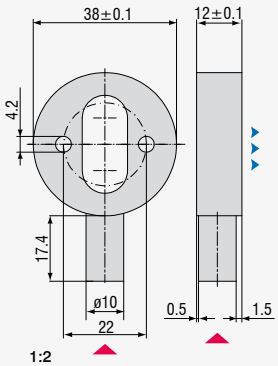
Measuring range 15mm
Temperature stability ≤ ±0.015%FSO/°C
Connection: integrated sealed
triaxial connector (ø 10mm)
Pressure resistance (static):
front and rear side splash water
Max. operating temperature: 150°C
Housing material: epoxy
Sensor cable: ECx



1:2

EU15(01) Unshielded Sensor

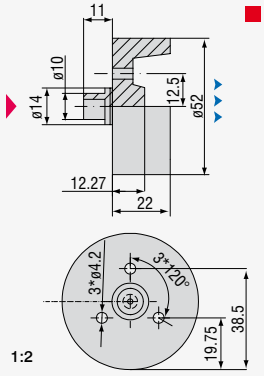
Measuring range 15mm
Temperature stability ≤ ±0.025%FSO/°C
Connection: integrated sealed
triaxial connector (ø 10mm)
Pressure resistance (static):
front and rear side splash water
Max. operating temperature: 150°C
Housing material: plastics
Sensor cable: ECx



1:2

EU15(05) Unshielded Sensor for combination with laser sensors

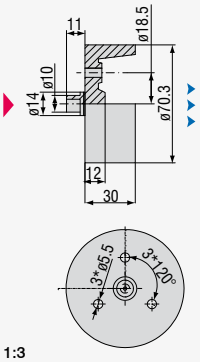
Measuring range 15mm
Temperature stability ≤ ±0.025%FSO/°C
Connection: integrated sealed
triaxial connector (ø 10mm)
Sensor with an eliptical hole to
measure through laser optically
Pressure resistance (static):
front and rear side splash water
Max. operating temperature: 150°C
Housing material: epoxy
Sensor cable: ECx



1:2

■ EU22 Unshielded Sensor

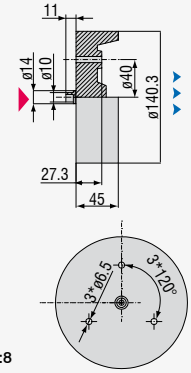
Measuring range 22mm
Temperature stability ≤ ±0.015%FSO/°C
Connection: integrated sealed
triaxial connector (ø 10mm)
Pressure resistance (static):
front and rear side splash water
Max. operating temperature: 150°C
Housing material: epoxy
Sensor cable: ECx



1:3

■ EU40 Unshielded Sensor

Measuring range 40mm
Temperature stability ≤ ±0.015%FSO/°C
Connection: integrated sealed
triaxial connector (ø 10mm)
Pressure resistance (static):
front and rear side splash water
Max. operating temperature: 150°C
Housing material: epoxy
Sensor cable: ECx

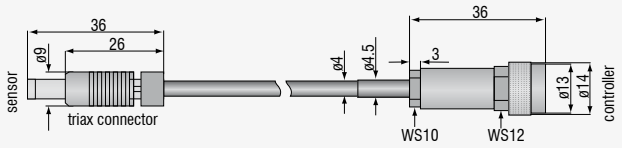


1:8

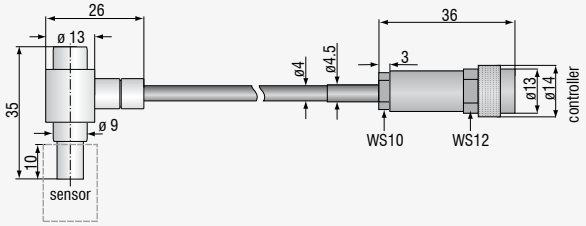
■ EU80 Unshielded Sensor

Measuring range 80mm
Temperature stability ≤ ±0.015%FSO/°C
Connection: integrated sealed
triaxial connector (ø 10mm)
Pressure resistance (static):
front and rear side splash water
Max. operating temperature: 150°C
Housing material: epoxy
Sensor cable: ECx

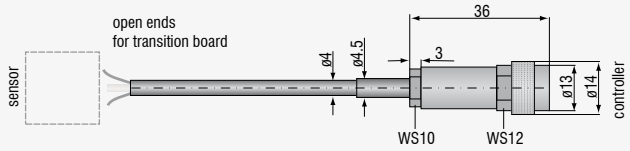
ECx sensor cable, Length is selectable up to x≤15m



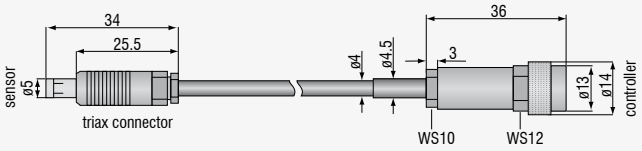
ECx/90 sensor cable with 90°connector (sensor-sided)
Length selectable up to x≤15m



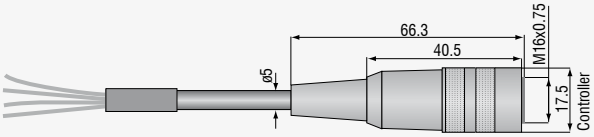
ECx/1 extension cable for solder connection
Sensor connection to transition board, both ends soldered.
Length selectable up to x≤15m



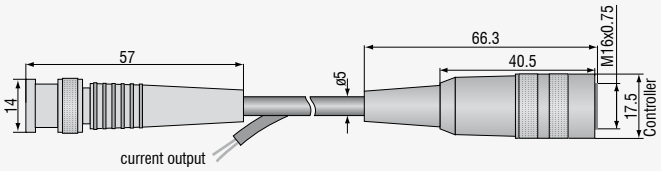
ECx/2 extension cable with miniature triax connector
Solder connection with transition board, sensor cable soldered, extension cable plugged. Length selectable up to x≤15m



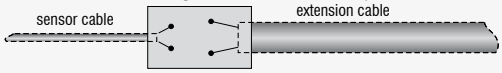
SCA3/5 signal cable for output signal voltage and current output 4 - 20mA, with open, tinned ends and eight-pole female connector suitable for DT3300 or DT3301 controller; length 3m



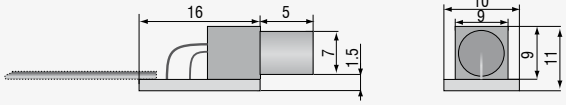
SCA3/5/BNC signal cable Signal cable analogue with BNC-connector for output voltage and tinned ends wires for current output 4 - 20mA, eight-pole female connector suitable for DT3300 or DT3301 controller; length 3m



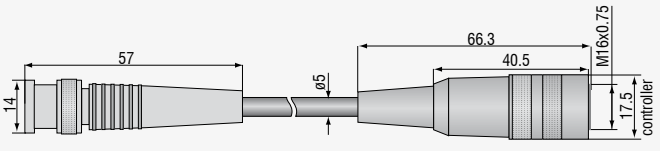
Transition board for ECx/1
both sides for soldering, 16 x 10 x 1.5mm (included in delivery)



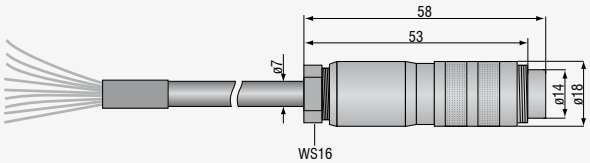
Transition board for ECx/2
one side with triax connection socket (included in delivery)



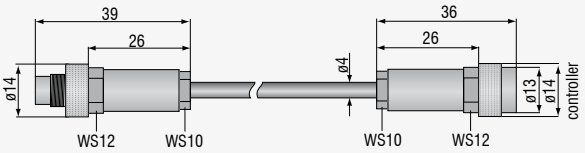
SIC3(07) signal cable for direct operation with oscilloscope
Voltage output signal cable with BNC connector;
for DT3300 / DT3301 controller; length 3m



SCD3/8 signal cable, switch-input and -output
with eight-pole male connector, open tinned ends for connecting the reset and / or limit switch output; necessary for 24 VDC supply of DT3301 controller; length 3m



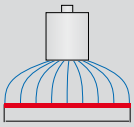
PSC30 supply and synchronisation cable for DT3300, length 0.3m
ESC30 synchronisation cable for DT3301 controller, length 0.3m



Target size of eddy current sensors

Type ES:
Measuring spot =
1.5x sensor diameter

ES (shielded sensor)
Measuring spot = 1.5x sensor diameter



Type EU:
Measuring spot =
3x sensor diameter

EU (unshielded sensor)
Measuring spot = 3x sensor diameter

The relative size of the measuring object to the sensor affects the linearity deviation for eddy current sensors. Ideally, the measuring object size for shielded sensors should be at least 1.5 times the diameter of the sensor and at least three times the diameter of the sensor for unshielded ones. From this size, almost all lines of magnetic field run from the sensor to the target. Therefore, almost all magnetic field lines penetrate the target via the face and so contribute to eddy current generation, where only a small linearity deviation occurs.

Factory calibration

As standard, the eddy current sensors are tuned to
- St37 for ferromagnetic calibration.
- Aluminium for non-ferromagnetic calibration

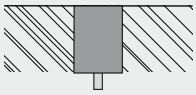
With other materials a factory calibration is recommended.

Assembly references

Eddy current sensors are grouped into shielded (e.g. ES05) and unshielded (e.g. EU05) sensors. With shielded sensors, the field lines run closer together due to a separate casing. These are less sensitive to radial flanking metals. Correct installation is important for signal quality. The following information applies for mounting in ferromagnetic and non-ferromagnetic materials.

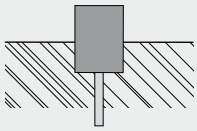
Assembly references for shielded sensors (ES) in metal

✓ **Correct**



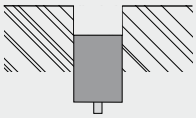
Flush mounting

✓ **Correct**



Protruding mounting

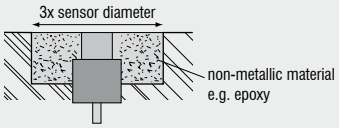
✗ **False**



Surrounding material attenuates the sensor; Measurement not possible.

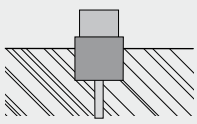
Assembly references for unshielded sensors (EU) in metal

✓ **Correct**



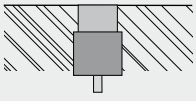
Sensor must be set up free-standing. Minimum distance to the sensor: approx. three times the diameter of the sensor

✓ **Correct**



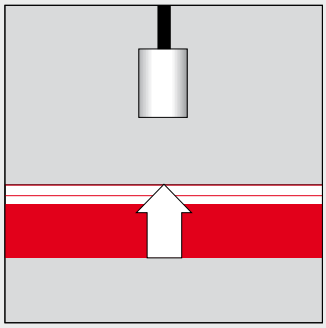
Protruding sensor mounting (approx. half the sensor‘s length protruding)

✗ **False**

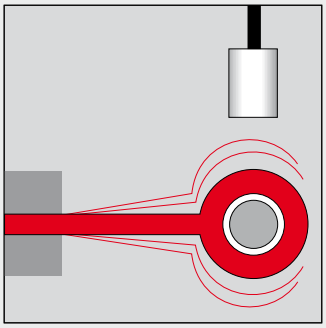


Surrounding material attenuates sensor in the standard version; Measurement not possible.

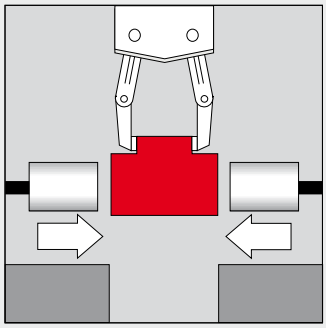
Eddy current sensors from Micro-Epsilon have many possible areas of application. High measurement accuracy and cut-off frequency with an extremely robust design means the sensors can take measurements that cannot normally be carried out using conventional sensors. The examples show typical applications for eddyNCDT sensors.



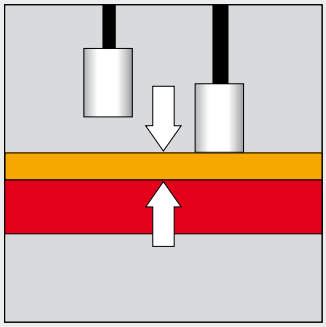
Displacement, distance
position, elongation



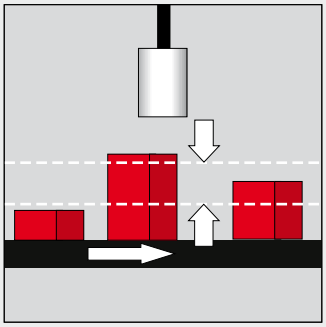
Vibration, amplitude,
clearance, oscillations



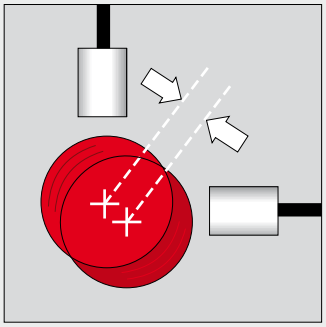
Centering, positioning,
tilt, alignment



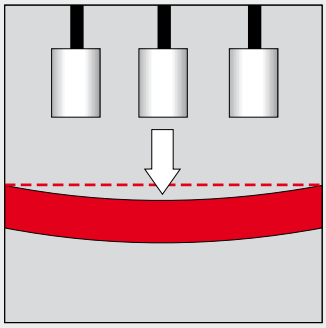
Thickness of layer, foil,
rubber, insulation



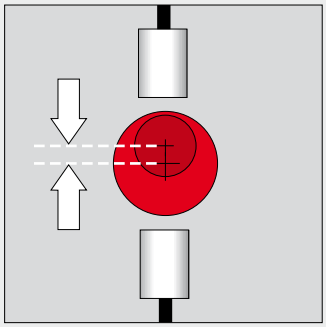
Dimensions, tolerances,
sorting, part recognition



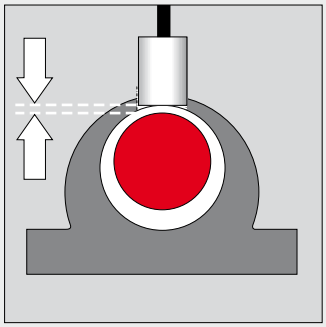
Shaft oscillation, orbit tracing,
shaft displacement



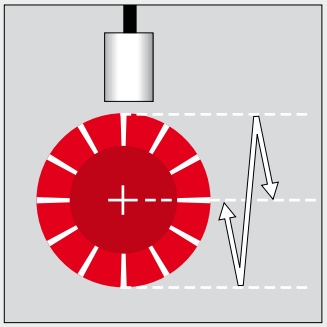
Deflection, deformation,
waviness



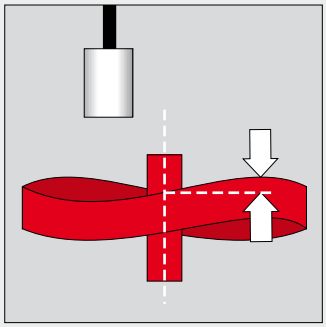
Eccentricity, diameter,
concentricity



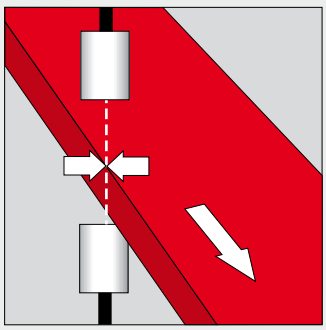
Bearing oscillations,
lubricating gap, wear



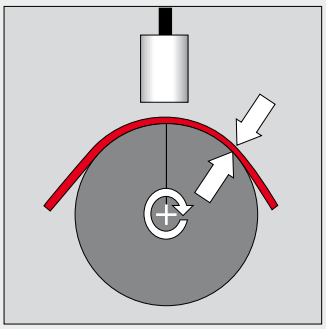
Collector concentricity,
roundness, air gap, pitch



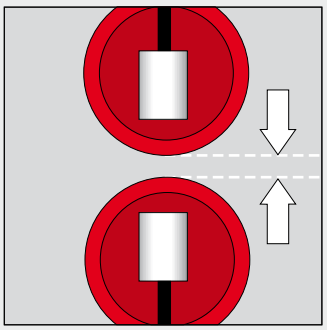
Stroke, deformation,
axial shaft oscillation



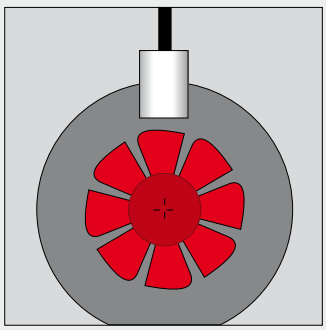
Edge control, position, width



Thickness of foil, layer, profile



Roller gap, roller deflection, crowning



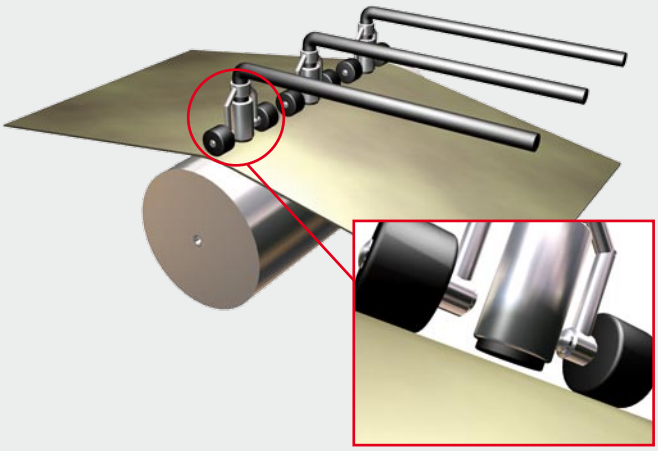
Compressor/turbine gap,
revolutions

Eddy current sensors from Micro-Epsilon represent high-performance measurement, particularly under extreme operating conditions. Environmental influences such as oil, temperature, pressure and moisture are largely compensated for and have a minimal effect on the signal. For this reason, the sensors are ideal in challenging application areas, such as industrial mechanical engineering and automotive inspection systems.

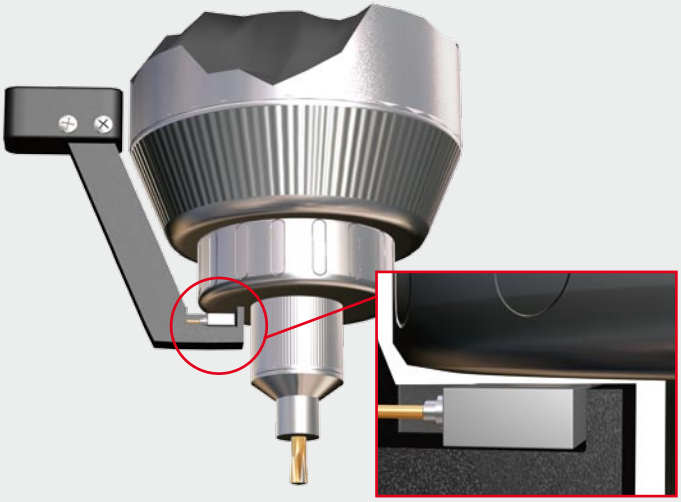
Picture on the left:
Tensile strength testing in steel works

Bottom pictures:
Different industrial applications

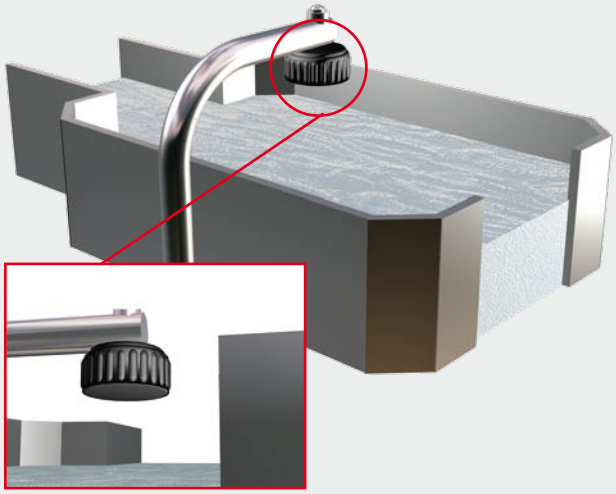
Pictures on the right:
Typical engine measurements



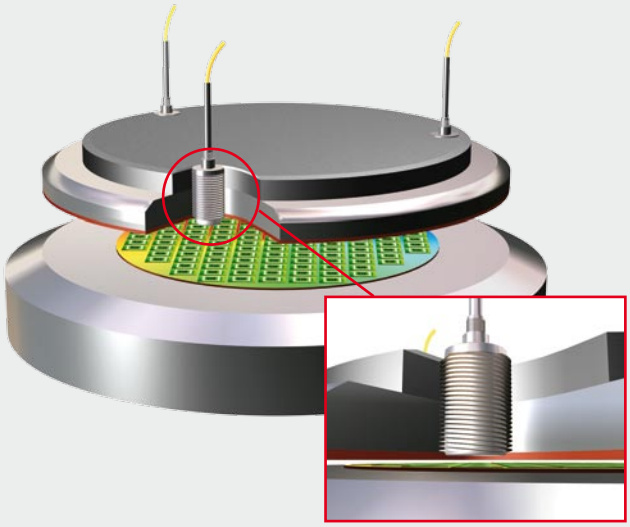
Thickness measurement of rubber.



Spindle growth measurement.



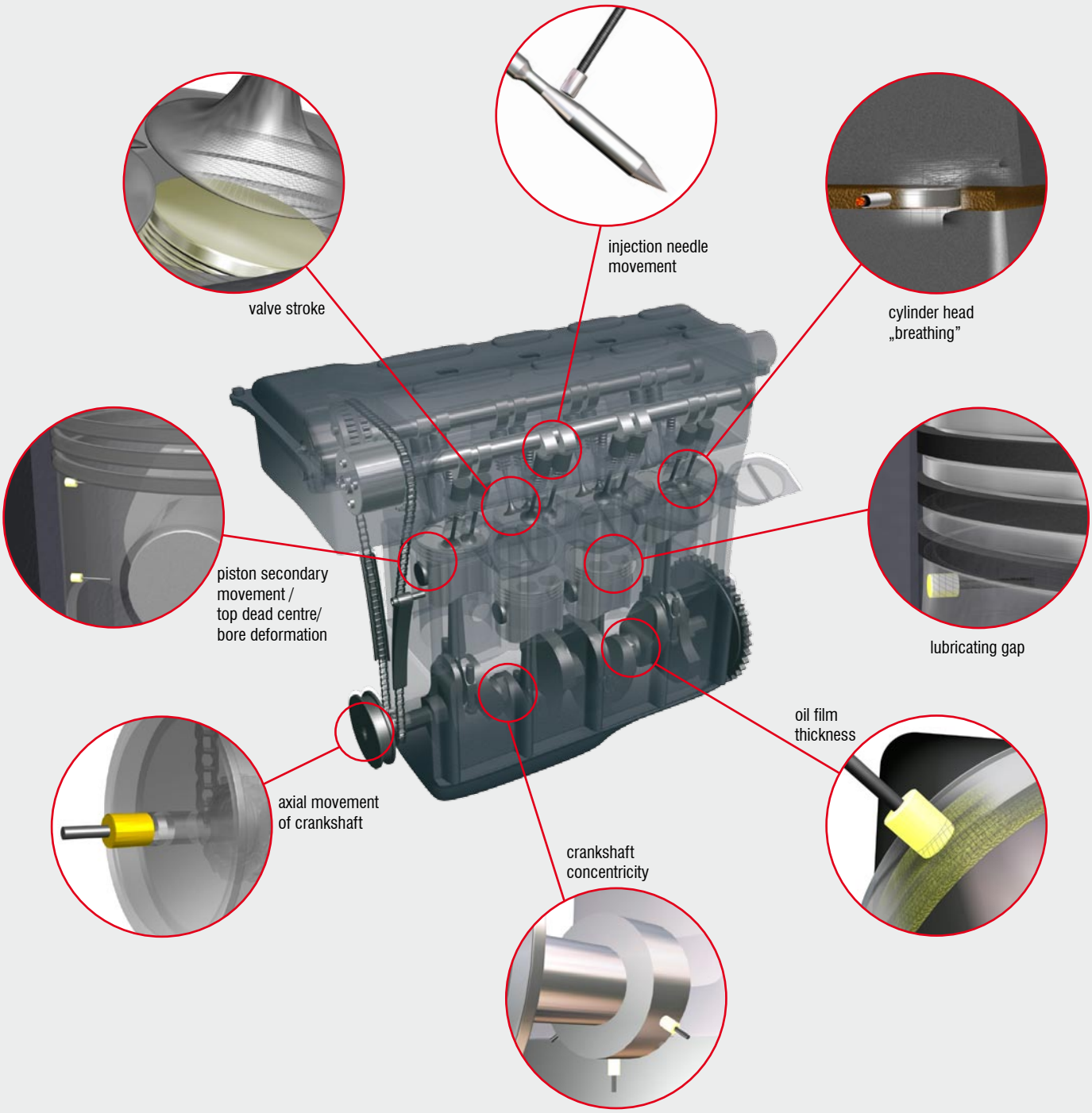
Level of liquid alumium.



Position of the wafer polishing disk.

Application examples for engine optimisation on the tester

Eddy current sensors from Micro-Epsilon are being used to test internal combustion engines. In towing and firing mode operations, the sensors record different measured values, which can contribute to the improvement of engine characteristics. The high measurement accuracies under extreme engine operating conditions distinguish the eddyNCDT eddy current sensors from competing sensors.



Accessories

ECx	**Sensor cable**, length selectable up to x≤15m
ECx/90	**Sensor cable** with 90° connector (sensor-sided) length selectable up to x≤15m
ECx/1	**Extension cable** for solder connection
ECx/2	**Extension cable** for with miniature triax connector
SCA3/5	**Signal cable** analogue, 3m
SCA3/5/BNC	**Signal cable** analogue with BNC connector, 3m
SCD3/8	**Signal cable** digital (switch input/outout), 3m (also for supply 11 - 32VDC); for DT3301
SIC3(07)	**Signal cable** with BNC connector for direct operation with oscilloscope
PSC30	**Power / Synchronisation cable**, 0.3m, for DT3300
ESC30	**Synchronisation cable**, 0.3m, for DT3301
PS300/12/5	**Power supply** Input 100 - 240VAC, Output ±12VDC / 5.2VDC integrated cable 1.5m; for max. 4x DT3300
PS2020	**Power supply** 24 V / 2.5 A, Input 100 - 240 VAC, output 24 VDC / 2.5 A, for snap in mounting on DIN 50022 rail
MC25	**Micrometer calibration fixture** Range 0 - 25mm; division 2µm; adjustable offset (zero); for sensors with measuring range <22mm
MC2.5	**Micrometer calibration fixture** Range 0 - 2.5mm, division 1µm
MBC300	**Mounting base** for controller DT330x, fixing through M4 threaded holes 166x108x60mm
MCT304-SM	**Tower** for max. 4 controller DT 3300; supply 100 - 240VAC
MCT304(01)	**Tower** for max. 4 controller DT 3301; supply 11 - 32VDC

eddyNCDT
Product range eddy current sensors

eddyNCDT 3010	Low-Cost single channel system for industrial applications
eddyNCDT 3100	Compact eddy current system with high-level of user-friendliness
eddyNCDT 3300	Intelligent eddy current system for very precise measurements
eddyNCDT 3700	Compact eddy current OEM system for differential measurements

Modifications reserved / Y9761123-C011072DGO

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