



# More Precision

**eddyNCDT** // Eddy current sensors for displacement and position





- High accuracy and temperature stability
- Active temperature compensation
- Bandwidth 25kHz (-3dB)
- For integration in harsh, industrial environments
- Multi-channel applications by synchronisation

#### System structure

The eddyNCDT 3010 is a compact, single-channel system consisting of an eddy current sensor, a sensor connecting cable and an amplifier electronics (signal conditioning unit). The sensors are factory-calibrated for aluminium (non-ferromagnetic) or steel St37 (ferromagnetic). Using three-point linearisation, the user can also compensate on site for other materials.

#### Temperature compensation

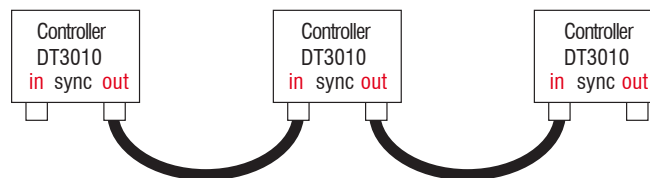
The eddyNCDT 3010 series is suitable in a wide temperature range. In the case of fluctuating ambient temperatures a stable output signal is very important for reliable measurements. Due to a patented temperature compensation method the eddyNCDT series 3010 offers a unique thermal stability, which no other system can offer.

The eddyNCDT 3010 is designed for industrial use in production plants, for machine control and for measuring and testing during in-process quality assurance.

#### Synchronisation

If several channels of series 3010 operate simultaneously close to one another, a mutual interference is possible because of slight differences in the oscillator frequencies.

This can be avoided by synchronisation. Two SMC connectors at the electronic box, one for oscillator signal output (sync out) and one for input (sync in) are standard equipment. The electronics operate independently as long as they are not interconnected. If connected together, they automatically switch to synchronised operation and are controlled by the first electronics (master). Any quantity of units can be synchronised by serial connection.



SC30 – synchronization cable (accessory)

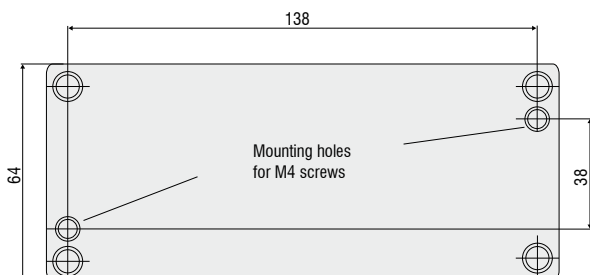
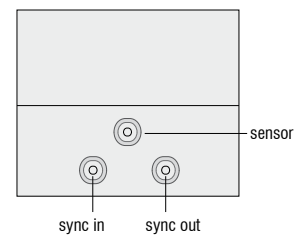
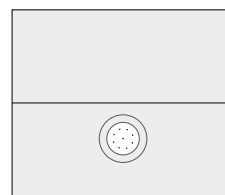
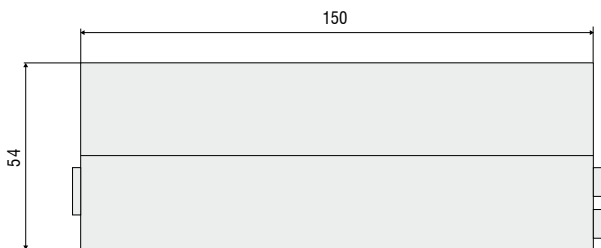
Controller	DT3010-A	DT3010-M
Material	non-ferromagnetic target	ferromagnetic target
Linearity	$\leq \pm 0.25\%$ FSO	
Resolution <sup>1)</sup>	0.005% FSO	
Repeatability	0.01% FSO	
Bandwidth	25kHz (-3dB)	
Temperature compensation range	standard: 10 to 65°C optional 0 to 90°C	
Temperature range controller	operation: 10 to 50°C	
	storage: -25 to 75°C	
Temperature stability controller (MMR)	$\leq 0.05\%$ FSO/°C	
Output	0 ... 10V / 10mA and 4 ... 20mA	
Power supply	24 VDC (9 ... 30V) / 205mA	
Electromagnetic compatibility (EMC)	acc. EN 50081-2 / EN 50082-2	
Synchronisation	with cable SC 30 (accessory)	
Protection class	controller	IP 54

FSO = of full scale output

MMR = midrange

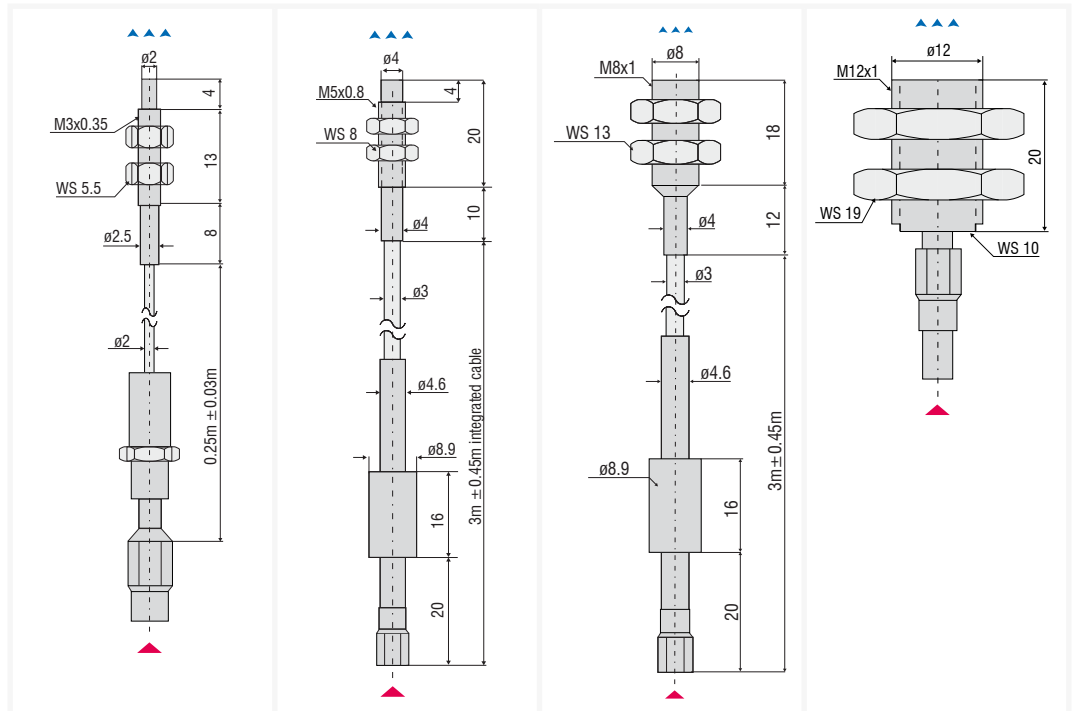
<sup>1)</sup> static resolution at midrange

#### Housing DT3010



▲▲▲▲  
Measurement direction

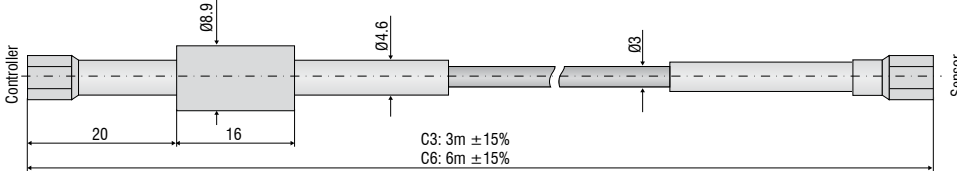
▲  
Connector side



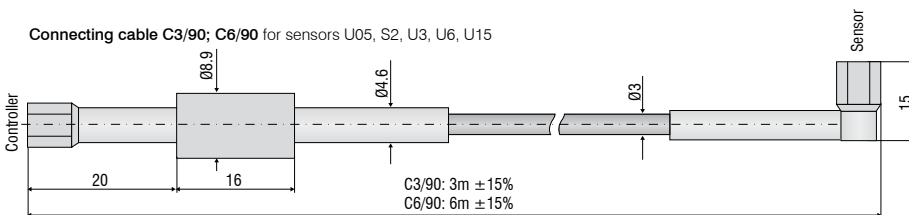
Sensor type	U05(09)	U1	S1	S2
Design	unshielded	unshielded	shielded	shielded
Measuring range	0.5mm	1mm	1mm	2mm
Offset distance	0.05mm	0.1mm	0.1mm	0.2mm
Linearity	$\leq \pm 1.25\mu\text{m}$	$\leq \pm 2.5\mu\text{m}$	$\leq \pm 2.5\mu\text{m}$	$\leq \pm 5\mu\text{m}$
Resolution	$0.025\mu\text{m}$	$0.05\mu\text{m}$	$0.05\mu\text{m}$	$0.1\mu\text{m}$
Repeatability	$0.05\mu\text{m}$	$0.1\mu\text{m}$	$0.1\mu\text{m}$	$0.2\mu\text{m}$
Temperature stability (MMR)	$\leq \pm 0.125\mu\text{m}/^\circ\text{C}$	$\leq \pm 0.25\mu\text{m}/^\circ\text{C}$	$\leq \pm 0.25\mu\text{m}/^\circ\text{C}$	$\leq \pm 0.5\mu\text{m}/^\circ\text{C}$
Integrated cable/ length	0.25m	3m	3m	-
Temperature sensor cable	180°C	180°C	180°C	-
Housing material	stainless steel and ceramic	stainless steel and plastic	stainless steel and plastic	stainless steel and plastic

MMR = midrange

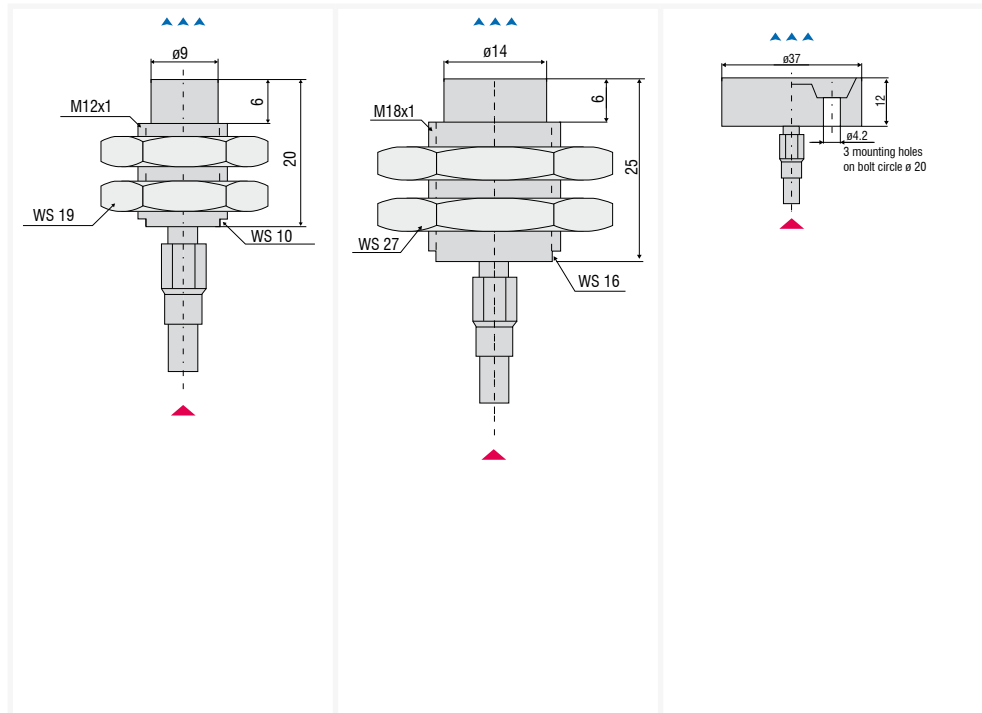
Connecting cable C3; C6 for sensors U05, S2, U3, U6, U15



Connecting cable C3/90; C6/90 for sensors U05, S2, U3, U6, U15

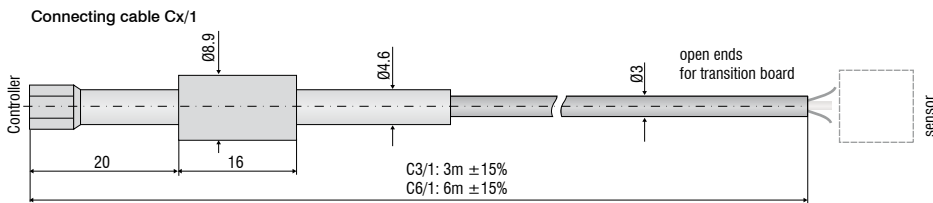


▲▲▲▲  
Measurement direction  
▲  
Connector side



Sensor type	U3	U6	U15
Design	unshielded	unshielded	unshielded
Measuring range	3mm	6mm	15mm
Offset distance	0.3mm	0.6mm	1.5mm
Linearity	$\leq \pm 7.5\mu\text{m}$	$\leq \pm 15\mu\text{m}$	$\leq \pm 37.5\mu\text{m}$
Resolution	$0.15\mu\text{m}$	$0.3\mu\text{m}$	$0.75\mu\text{m}$
Repeatability	$0.3\mu\text{m}$	$0.6\mu\text{m}$	$1.5\mu\text{m}$
Temperature stability (MMR)	$\leq \pm 0.75\mu\text{m}/^\circ\text{C}$	$\leq \pm 1.5\mu\text{m}/^\circ\text{C}$	$\leq \pm 3.75\mu\text{m}/^\circ\text{C}$
Integrated cable/ length	-	-	-
Temperature sensor cable	-	-	-
Housing material	stainless steel and plastic	stainless steel and plastic	epoxy

MMR = midrange



**Cable Cx / Cx1 / Cx/90**

Cable design: coaxial with sheath wire  
 Sheath material: FEP/Flour-Thermoplast  
 Temperature resistance: -50°C to +200°C  
 Outer diameter: 2.95mm ± 0.05mm  
 Bending radius: one-time bending during installation: 2 x cable diameter  
 minimum bending radius for movement: 5 x cable diameter  
 optimum bending radius at continuous movement: 10 x cable diameter  
 Suitable for use with robots: no

**Plug**

Type: female connector, coaxial, SMC  
 Locking method: screw  
 Protection class: no details  
 Temperature resistance: -65 to +165°C  
 Material housing: brass nickel-plated  
 Mechanical service life: > 500 mating cycles

**Sensor side/Controller side**

female connector, coaxial, SMC  
 screw  
 no details  
 -65 to +165°C  
 brass nickel-plated  
 > 500 mating cycles

Article	Description	eddyNCDT 3001	eddyNCDT 3005	eddyNCDT 3010	eddyNCDT 3100	eddyNCDT 3300
PC3/8	Power- and output cable, 3m, 8 pin			•		
PC5/5	Power- and signal cable	•	•			
SC30	Synchronisation cable, 30cm			•		
CSP 301	Digital signal processing and display unit up to 2 channels			•		
PC3100-3/6/BNC	Output cable and supply unit, 3m				•	
PS2020	Power Supply 24V / 2.5A; Input 100-240 VAC; Output 24 VDC / 2.5A; DIN rail mounting; 35mm x 7.5mm, DIN 50022				•	•
MC2.5	Micrometer calibration fixture, range 0 to 2.5 mm, division 1 $\mu$ m, for sensors EPU05 to EPS2, adjustable offset (zero)			•	•	•
MC25D	Micrometer calibration fixture, range 0 to 25mm, division 1 $\mu$ m, for sensors EPU05 to EPU15, adjustable offset (zero)			•	•	•
ECx	Sensor cable, length selectable up to 15m					•
ECx/90	Sensor cable with 90° connector (sensor-sided) length selectable up to 15m					•
ECx/1	Extension cable for solder connection					•
ECx/2	Extension cable for plug connection					•
SCA3/5	Signal cable analogue, 3m					•
SCA3/5/BNC	Signal cable analogue with BNC connector, 3m					•
SCD3/8	Signal cable digital (switch input/output), 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 $\pm$ 12VDC / 5.2VDC integrated cable 1.5m; for max. 4x DT3300					•
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					•

## High performance sensors made by Micro-Epsilon



Sensors and systems for displacement and position



Sensors and measurement devices for non-contact temperature measurement



2D/3D profile sensors (laser scanner)



Optical micrometers, fibre optic sensors and fibre optics



Colour recognition sensors, LED analyzers and colour online spectrometer



Measurement and inspection systems