



# More Precision

**eddyNCDT** // Inductive sensors based on eddy currents





- *Combination of linearity, resolution and temperature stability sets new standards*
- *Easy integration with modern fieldbus connection and smart signal processing*
- *Maximum ease of use and intuitive configuration via web interface*
- *Industrial suitability due to robust system design*
- *Wide range of applications with more than 400 sensor models*

#### Performance and universality for industrial use

The eddyNCDT 3060 is a new, powerful eddy current measuring system for fast, high precision displacement measurements. The system comprises a compact controller, a sensor and an integrated cable and is factory-calibrated for either ferromagnetic or non-ferromagnetic materials. With more than 400 compatible sensor models, ease of use and smart signal processing, the eddyNCDT 3060 defines a new performance class in inductive displacement measurement.

#### Ideal for integration into plant and machinery

As sensor and controller are temperature-compensated, a high measurement accuracy can be achieved even in fluctuating temperatures. The sensors are designed for ambient temperatures up to a maximum of +200 °C and an ambient pressure up to 20 bar. The compact controller design as well as the fieldbus connection make the measuring system ideal for integration into plant and machinery.

#### New benchmark in controller technology

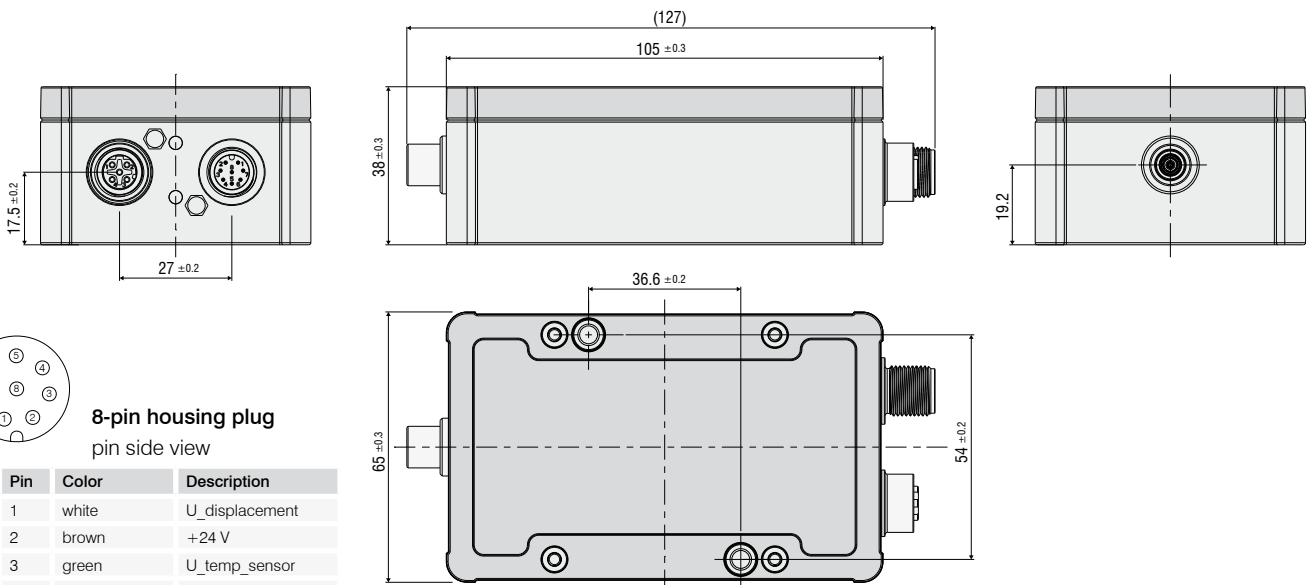
The industrial-grade M12 Ethernet interface offers a modern fieldbus connection. Configurable analog outputs enable to output the measured values as voltage or current. When connecting a PC via the Ethernet interface, a modern web interface can be accessed without any further installation and enables the software setting of sensor and controller.

The DT3061 controller provides enhanced features such as 5-point calibration, setting of switching and temperature outputs, as well as storage of multiple characteristic curves. When two or more systems operate next to one another, there is no need for synchronization. For operating several systems, a new frequency separation is provided, which enables to operate these systems in parallel without influencing one another.

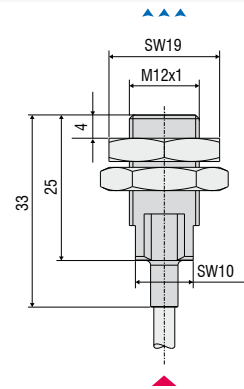
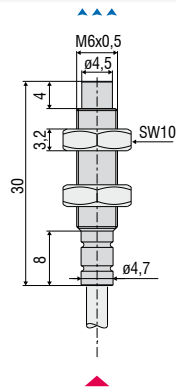
Features	Controller type	
	DT3060	DT3061
Active temperature compensation for sensor and controller	✓	✓
Frequency separation (LF & HF)	✓	✓
Industrial Ethernet interface	✓	✓
Intuitive web interface	✓	✓
Multipoint calibration regardless of the distance (up to 3 points)	✓	✓
Scalable measuring range via analog output (teach function)	✓	✓
Scalable analog output	✓	✓
Switching and temperature outputs	-	✓
5-point calibration	-	✓
Storage of multiple characteristic curves	-	✓

Model	DT3060	DT3061
Resolution <sup>1)</sup>	static (20 Hz)	0.002 % FSO
	dynamic (20 kHz)	0.01 % FSO
Frequency response (-3 dB)	selectable (20 kHz, 5 kHz, 20 Hz)	
Measuring rate	50 kSa/s	
Linearity	3-point linearization	≤ ± 0.2% FSO
	5-point linearization	-
Temperature stability	≤ 0.015 % FSO / K	
Temperature compensation	+10 ... +50 °C	
Synchronization	no sync - LF & HF variants	
Target material	ferromagnetic, non-ferromagnetic	
Supply voltage	12 ... 32 VDC	
Power consumption	2.5 W	
Analog output	0 ... 10 V (short circuit proof); 4 ... 20 mA (load max. 500 Ohm)	
Digital interface	Industrial Ethernet (M12 socket)	
Connection	M12 connector	
Mounting	through bores	
Temperature range	Storage	-10 ... +70 °C
	Operation	0 ... +50 °C
Shock (DIN-EN 60068-2-29)	15 g / 6 ms in 3 axes, 2 directions and 1000 shocks each	
Vibration (DIN-EN 60068-2-6)	5 g / 10 ... 500 Hz in 3 axes, 2 directions and 10 cycles each	
Protection class (DIN-EN 60529)	IP67 (when connected)	
Material	die-cast aluminum	
Weight	approx. 230 g	
No. of characteristic curves	1	max. 4

FSO = Full Scale Output  
<sup>1)</sup> RMS noise relates to midrange



▲▲▲▲  
Measurement direction  
▲  
Cable side



Sensor type		ES-U1	ES-S2
Measuring range		1 mm	2 mm
Start of measuring range		0.1 mm	0.2 mm
Resolution <sup>1) 2) 3)</sup>		0.02 $\mu\text{m}$	0.04 $\mu\text{m}$
Linearity <sup>1)</sup>	3-point linearization	$\leq \pm 2 \mu\text{m}$	$\leq \pm 4 \mu\text{m}$
	5-point linearization <sup>4)</sup>	$\leq \pm 1 \mu\text{m}$	$\leq \pm 2 \mu\text{m}$
Temperature stability <sup>1) 2)</sup>		$\leq 0.15 \mu\text{m} / \text{K}$	$\leq 0.3 \mu\text{m} / \text{K}$
Temperature compensation		+10 ... +180 °C	+10 ... +180 °C
Min. target size (flat)	Operation	$\varnothing 18 \text{ mm}$	$\varnothing 18 \text{ mm}$
Sensor type		unshielded	shielded
Connection		integrated cable, axial standard length 3 m; 1 m, 6 m, 9 m optional <sup>5)</sup>	integrated cable, axial standard length 3 m; 1 m, 6 m, 9 m optional <sup>5)</sup>
Mounting		cable gland (M6)	cable gland (M12)
Temperature range	Storage	-50 ... +180 °C	-50 ... +200 °C
	Operation	-20 ... +180 °C	-20 ... +200 °C
Pressure resistance	Front	20 bars	20 bars
	Rear	5 bars	5 bars
Shock (DIN-EN 60068-2-29)		30 g	30 g
Vibration (DIN-EN 60068-2-6)		15 g	15 g
Protection class (DIN-EN 60529)		IP68 (plugged)	IP68 (plugged)
Material		stainless steel and plastic	stainless steel and plastic
Weight		2.4 g (without nuts)	11 g (without nuts)

FSO = Full Scale Output

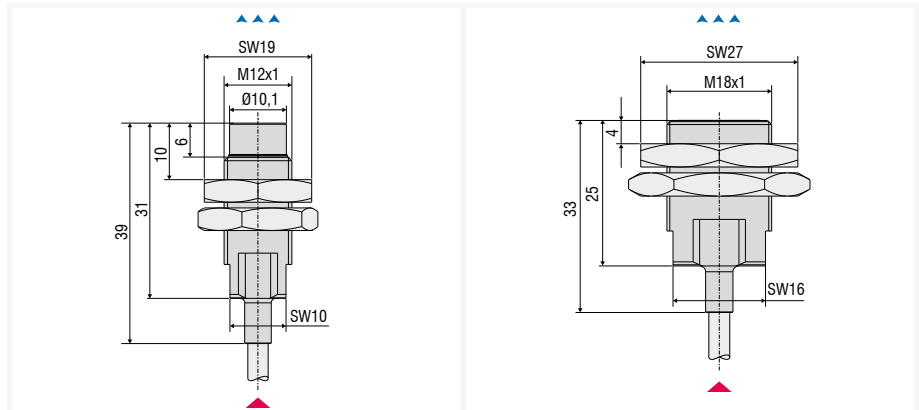
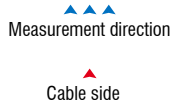
<sup>1)</sup> valid for operation with DT306x controller, referred to nominal measuring range

<sup>2)</sup> relates to midrange

<sup>3)</sup> RMS value of the signal noise, static (20 Hz)

<sup>4)</sup> only available with controller DT3061

<sup>5)</sup> Length tolerance cable: +0.5 m / +1.25 m / +2.35 m / +3.5 m



Sensor type		ES-U3	ES-S4
Measuring range		3 mm	4 mm
Start of measuring range		0.3 mm	0.4 mm
Resolution <sup>1) 2) 3)</sup>		0.06 µm	0.08 µm
Linearity <sup>1)</sup>	3-point linearization	≤ ± 6 µm	≤ ± 8 µm
	5-point linearization <sup>4)</sup>	≤ ± 3 µm	≤ ± 4 µm
Temperature stability <sup>1) 2)</sup>		≤ 0.45 µm / K	≤ 0.6 µm / K
Temperature compensation		+10 ... +180 °C	+10 ... +180 °C
Min. target size (flat)	Operation	Ø 36 mm	Ø 27 mm
Sensor type		unshielded	shielded
Connection		integrated cable, axial standard length 3 m; 1 m, 6 m, 9 m optional <sup>5)</sup>	integrated cable, axial standard length 3 m; 1 m, 6 m, 9 m optional <sup>5)</sup>
Mounting		cable gland (M12)	cable gland (M18)
Temperature range	Storage	-50 ... +200 °C	-50 ... +200 °C
	Operation	-20 ... +200 °C	-20 ... +200 °C
Pressure resistance	Front	20 bars	20 bars
	Rear	5 bars	5 bars
Shock (DIN-EN 60068-2-29)		30 g	30 g
Vibration (DIN-EN 60068-2-6)		15 g	15 g
Protection class (DIN-EN 60529)		IP68 (plugged)	IP68 (plugged)
Material		stainless steel and plastic	stainless steel and plastic
Weight		12 g (without nuts)	30 g (without nuts)

FSO = Full Scale Output

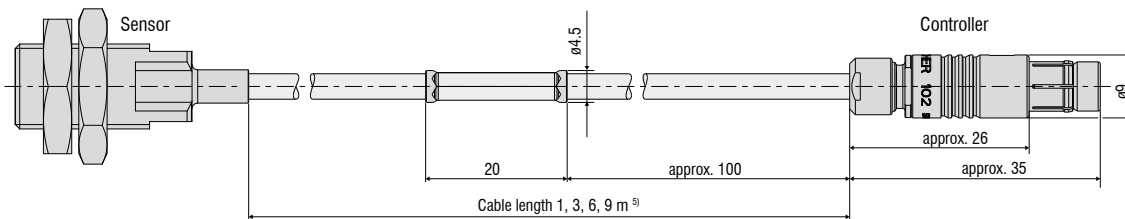
<sup>1)</sup> valid for operation with DT306x controller, referred to nominal measuring range

<sup>2)</sup> relates to midrange

<sup>3)</sup> RMS value of the signal noise, static (20 Hz)

<sup>4)</sup> only available with controller DT3061

<sup>5)</sup> Length tolerance cable: +0.5 m / +1.25 m / +2.35 m / +3.5 m



**Cables**

Cable design	coaxial
Sheath material	FKM
Temperature stability	-20...+200 °C
Outer diameter	3.6 mm ± 0.2 mm
Bending radius	static: ≥ 18 mm
	dynamic: ≥ 36 mm
Suitable for use with robots	no

**Connector (controller)**

Model	triaxial connector, type B
Locking method	push-pull
Protection class	IP 68 (connected)
Temperature stability	-20 ... +200 °C
Material (housing)	nickel- and chrome-plated brass
Mechanical service life	10,000 cycles

Article	Description	eddyNCDT 3001	eddyNCDT 3005	eddyNCDT 3060	eddyNCDT 3300
PCx/8-M12	Supply and signal cable, 8-pin, lengths: 3 / 5 / 10 / 15 m			•	
PCx/5-M12	Supply and signal cable, 5-pin, 5 m / 20 m	•	•		
SCD2/4/RJ45	Industrial Ethernet cable with M12 connector, 4-pin, 2 m			•	
PS2020	Power supply 24 V / 2.5 A, input 100 - 240 VAC, output 24 VDC / 2.5 A, mounting onto symmetrical standard rail 35 mm x 7.5 mm, DIN 50022;	•	•	•	•
SCAx/5	Signal cable, analog, 3 / 6 / 9 m				•
SCDx/8	Signal cable for switching inputs and outputs, 3 / 6 m (also for 11 - 32 VDC supply); for DT3301				•
PSCx	Supply and synchronization cable 0.3 / 1 m, for DT3300				•
ESCx	Synchronization cable 0.3 / 1 m, for DT3301				•

## 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, fiber optic sensors and fiber optics



Color recognition sensors, LED analyzers and color online spectrometer



Measurement and inspection systems