



# More Precision

**eddyNCDT 3060** // High-performance inductive displacement measuring system





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

#### Inductive displacement measurement based on eddy currents

Non-contact, inductive displacement sensors from Micro-Epsilon operate according to the eddy current measuring principle. Unlike conventional, inductive displacement sensors, they measure position, displacement and distance with high accuracy, bandwidth and temperature stability on ferromagnetic and non-ferromagnetic materials. Due to their immunity to oil, dirt, pressure and temperature, these inductive eddy current sensors are primarily used in industrial environments.

#### 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 enables 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. If 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.

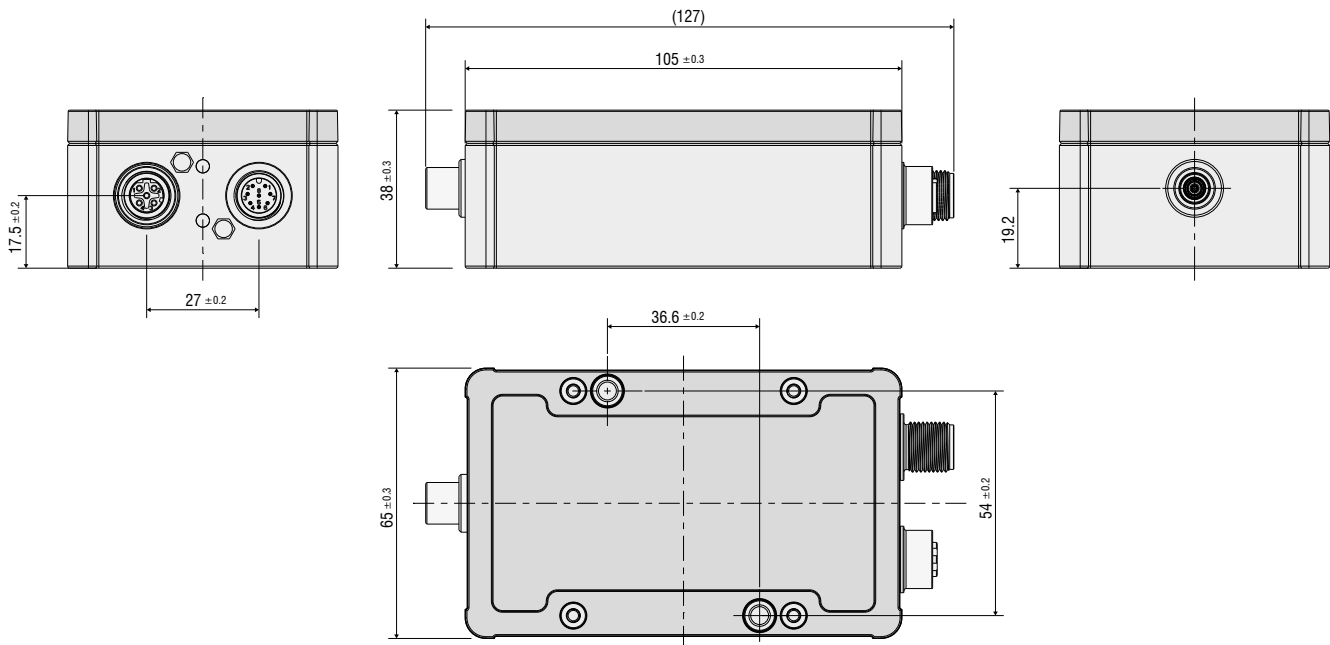
Features	Controller type	
	DT3060	DT3061
Active temperature compensation for sensor and controller	✓	✓
Frequency separation (LF & HF)	✓	✓
Industrial Ethernet interface	✓	✓
Intuitive web interface	✓	✓
Multipoint calibration regardless of the distance (up to 3 points)	✓	✓
Scalable measuring range via analog 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>	up to 20Hz		≤0.002% FSO
	up to 5kHz		≤0.005% FSO
	up to 20kHz		≤0.01% FSO
Linearity deviation	3-point linearization		≤0.2% FSO
	5-point linearization	-	≤0.1% FSO
Bandwidth (-3 dB)		20 kHz / 5 kHz / 20 Hz (selectable)	
Temperature compensation range	sensor	10°C ... 180°C	
	controller	10°C ... 50°C	
Temperature stability (MMR)	sensor	≤0.015 % FSO / °C	
	controller	≤0.015 % FSO / °C	
Ambient temperature	sensor	-20°C ... +180°C	
	controller	0°C ... +50°C	
Output (configurable)	analog	voltage (0 V ... 10 V), current (4 mA ... 20 mA)	
	digital	Industrial Ethernet (socket with M12 thread); 50kSa/s	
Power supply		12V ... 32V	
Weight		approx. 230g	
Synchronization		no sync - LF & HF variants	
Protection class (controller)		IP67 (when connected)	

FSO = full scale output

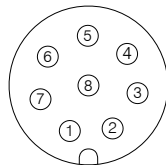
MMR = midrange

<sup>1)</sup> RMS noise relates to midrange

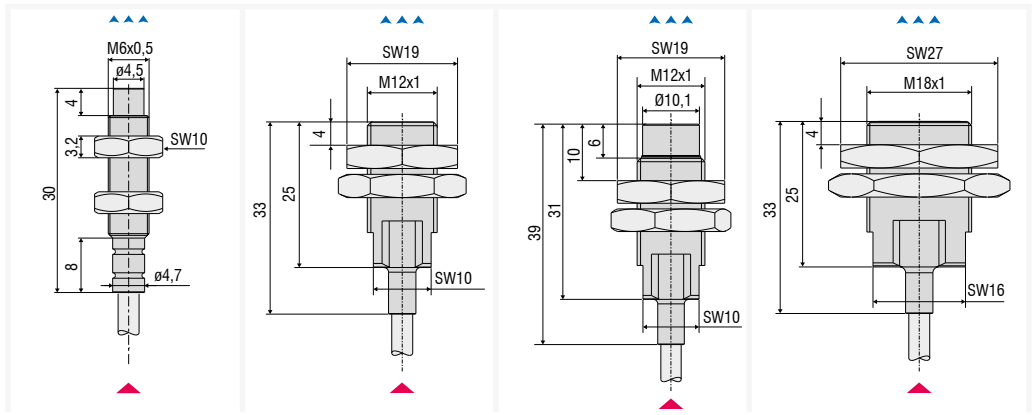
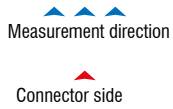


#### 8-pin controller connector, pin side view

Pin	Color	Description
1	white	U_displacement
2	brown	+24V
3	green	U_temp_sensor
4	yellow	U_temp_electr
5	gray	GND_temp_SW
6	pink	GND_displacement
7	blue	GND_power
8	red	I_displacement



# Sensors



Sensor type		ES-U1	ES-S2	ES-U3	ES-S4
Design		unshielded, cylindrical	shielded, cylindrical	unshielded, cylindrical	shielded, cylindrical
Measuring range (nominal)		1mm	2mm	3mm	4mm
Offset distance		0.1mm	0.2mm	0.3mm	0.4mm
Linearity deviation <sup>1)</sup>	3-point linearization	≤2μm	≤4μm	≤6μm	≤8μm
	5-point linearization	≤1μm	≤2μm	≤3μm	≤4μm
Resolution <sup>1) 2) 3)</sup>		≤0.02μm	≤0.04μm	≤0.06μm	≤0.08μm
Temperature stability <sup>1) 2)</sup>		≤0.15μm/°C	≤0.3μm/°C	≤0.45μm/°C	≤0.6μm/°C
Temperature range	operation	-20°C ... +180°C	-20°C ... +200°C	-20°C ... +200°C	-20°C ... +200°C
Cable		integrated, axial	integrated, axial	integrated, axial	integrated, axial
Pressure resistance, static	front	20 bar	20 bar	20 bar	20 bar
	rear	5 bar	5 bar	5 bar	5 bar
Vibration / shock <sup>4)</sup>		15g / 30g	15g / 30g	15g / 30g	15g / 30g
Protection class	sensor	IP68	IP68	IP68	IP68
	plug-in connector, mated	IP68	IP68	IP68	IP68
Weight <sup>5)</sup>		2.4g	11g	12g	30g
Min. target diameter		18mm	18mm	36mm	27mm
Material (sensor housing)		stainless steel and plastic	stainless steel and plastic	stainless steel and plastic	stainless steel and plastic

FSO = full scale output

<sup>1)</sup> valid for operation with DT3060 controller, referred to nominal measuring range

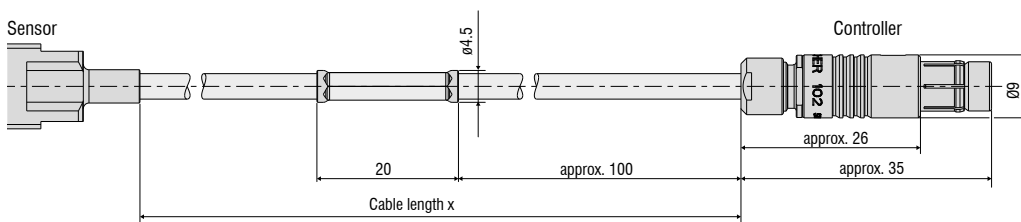
<sup>2)</sup> relates to midrange

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

<sup>4)</sup> Vibration test according to IEC 60068-2-6, shock test according to IEC 60068-2-27

<sup>5)</sup> Weight of sensor head: without nuts, with cable until end of crimp sleeve

## EC-X sensor cable 1/3/6/9 m<sup>6)</sup>



### Cable

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

### Plug model

Type	socket
Locking method	push-pull
Protection class	IP68 (when connected)
Temperature stability	-20°C ... +200°C
Material (housing)	nickel- and chrome-plated brass
Mechanical service life	10,000 cycles

### Controller side

socket	socket
push-pull	push-pull
IP68 (when connected)	IP68 (when connected)
-20°C ... +200°C	-20°C ... +200°C
nickel- and chrome-plated brass	nickel- and chrome-plated brass
10,000 cycles	10,000 cycles

### Sensor side

triaxial connector, type B	triaxial connector, type B
push-pull	push-pull
IP68 (when connected)	IP68 (when connected)
-20°C ... +200°C	-20°C ... +200°C
nickel- and chrome-plated brass	nickel- and chrome-plated brass
10,000 cycles	10,000 cycles

<sup>6)</sup> Length tolerance cable: +0.5m / +1.25m / +2.35m / +3.5m



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