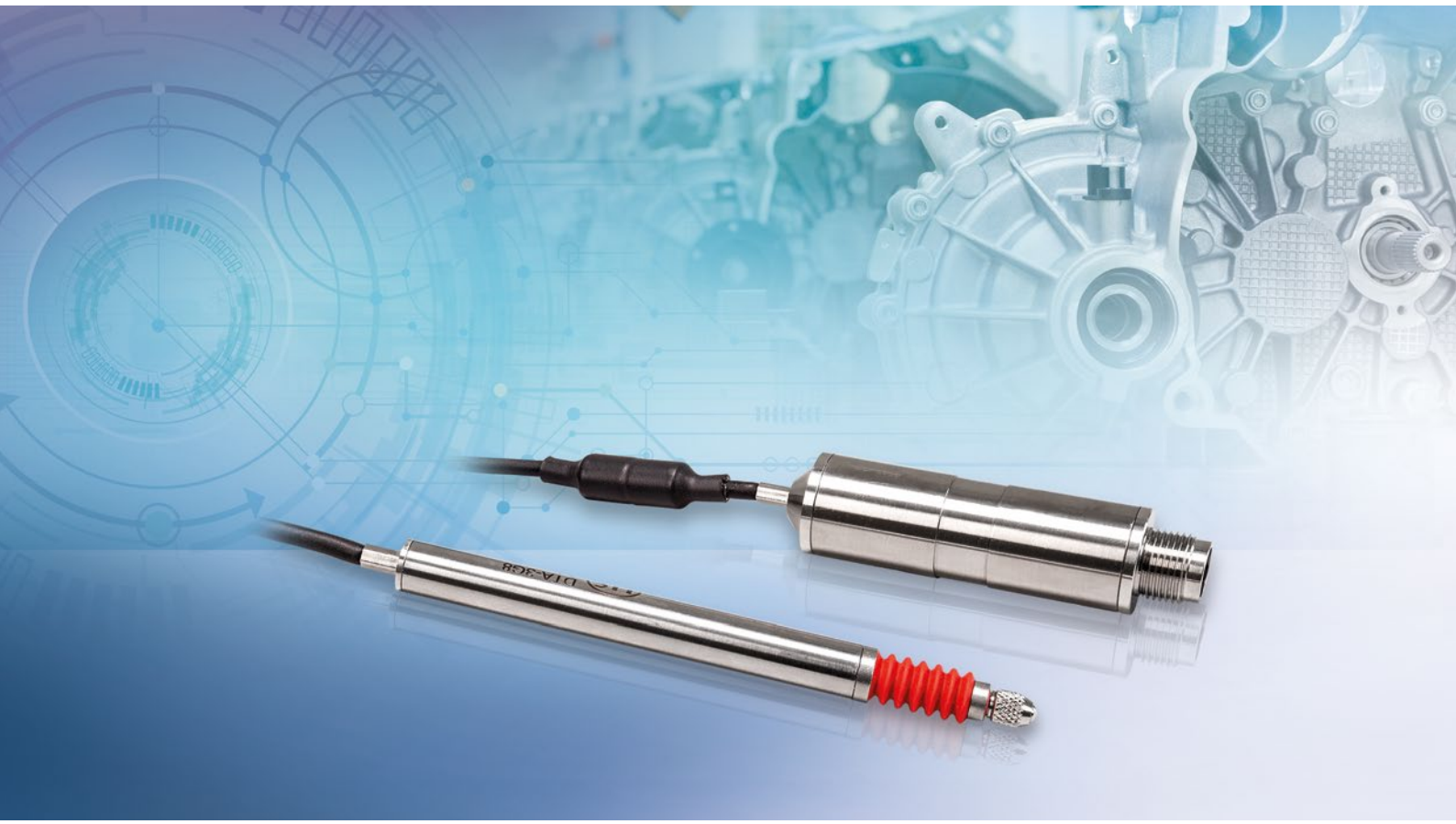
MICRO-EPSILON

More Precision.

induSENSOR DTD-xG8 // Inductive displacement measuring system



Inductive displacement measuring system
induSENSOR DTD-xG8

- Compact measuring system
- Proven LVDT technology with high resolution
- Excellent price/performance ratio
- Measuring ranges ±1 … ±10 mm
- Robust design for industrial applications
- Ideal for serial applications in machine building and automation

Compact design

The compact DTD inductive displacement measuring system consists of a DTA gauge with a plunger guided by a plain bearing and a controller, which are connected to each other with a cable. This system is ideal for the integration in machines as it requires only little installation space. The controller has a diameter of just 18 mm and the 3m-long cable enables flexible installation.

Characteristics & design

The DTD system is based on the proven LVDT technology. It impresses with outstanding precision and provides resolutions down to the micrometer range. The system is available for the measuring ranges ±1 mm, ±3 mm, ±5 mm and ±10 mm which cover numerous measurement tasks. Due to the high system signal stability, the induSENSOR DTD impresses in measurement tasks where high accuracy is required. The controller has a compact and robust housing made of stainless steel. As it provides high temperature stability, resistance to shocks and vibrations as well as insensitivity to dirt, this system can be used for industrial measurement tasks. The system also has an excellent price/performance ratio, and in case of high-volume applications, unit pricing is particularly attractive.

Interfaces & connections

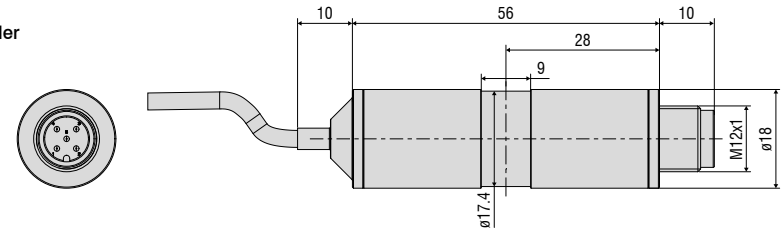
The system has a number of selectable analog and digital interface configurations. Modern fieldbuses such as Ethernet, PROFINET or EtherCAT are also supported via optionally available interface modules. If needed, parameter setting of the system can be carried out via powerful software or a web interface.

Applications

The DTD system is preferably used in applications for high precision measurement and inspection of workpiece geometry. It is ideal for series applications in machine building and automation technology.

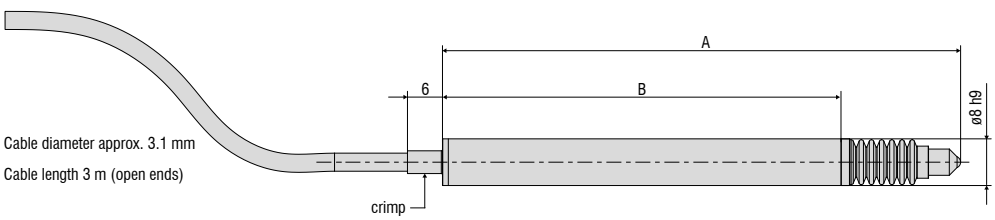
Spring-loaded plunger

Controller



Dimensions in mm, not to scale

DTA Gauges



Gauge model	A (zero position)	B
DTA-1G8-3-CA	82.8 mm	64.3 mm
DTA-3G8-3-CA	88.2 mm	68.3 mm
DTA-5G8-3-CA	118.0 mm	89.5 mm
DTA-10G8-3-CA	155.0 mm	121.7 mm

Model		DTD-1G8	DTD-3G8	DTD-5G8	DTD-10G8
Measuring range		±1 mm	±3 mm	±5 mm	±10 mm
Resolution [1]		13 bits (0.012 % FSO) at 50 Hz 12 bits (0.024 % FSO) at 300 Hz			
Frequency response (-3dB)		Default settings: 50 Hz; up to 300 Hz adjustable via software			
Linearity		≤ ±6 µm	≤ ±18 µm	≤ ±30 µm	≤ ±60 µm
		≤ ±0.3% FSO			
Repeatability [2]		≤ 0.15 µm	≤ 0.45 µm	≤ 0.75 µm	≤ 1.50 µm
		≤ ± 0.0075 % FSO			
Temperature stability	Sensor	≤ 250 ppm FSO/K			
	Controller	≤ 100 ppm FSO/K			
Supply voltage		14 … 30 VDC (5 … 30 VDC [3])			
Max. current consumption		40 mA			
Digital interface		RS485 / PROFINET [4] / EtherNet/IP [4] / Ethernet [4] / EtherCAT [4]			
Analog output [3] [5]		(0)2 … 10 VDC / 0.5 … 4.5 V / 0 … 5 V (Ra > 1 kOhm) or 0(4) … 20 mA (load < 500 ohm)			
Connection	Output side	5-pin connector M12 (cable see accessories)			
	Sensor side	Sensor: integrated cable, length 3 m (±50 mm), min. bending radius: fixed installation: 8x diameter (25 mm) in motion: 12x diameter (38 mm) drag chain: 15x diameter (47 mm)			
Mounting		Circumferential clamping [6]			
Temperature range	Storage	-40 °C … +80 °C			
	Operation	Sensor (without bellows): -20 … +80 °C Sensor (with bellows): 0 … +80 °C Controller: -40 °C … +85 °C			
Pressure resistance		Atmospheric pressure			
Shock (DIN EN 60068-2-27)		40 g / 6 ms in 3 axes, 2 directions and 1000 shocks each 100 g / 5 ms in 3 axes, 2 directions and 9 shocks each			
Vibration (DIN EN 60068-2-6)		± 1.5 mm / 5 … 57 Hz in 3 axes, 10 cycles each ± 20 g / 57 … 500 Hz in 3 axes, 10 cycles each			
Protection class (DIN EN 60529)	Sensor	IP65 (with bellows); IP54 (without bellows)			
	Controller	IP67			
Material	Sensor	Stainless steel (housing); FPM (bellows); PUR (cable sheath); PVC/PP (cable braids)			
	Controller	Stainless steel			
Weight	Sensor	approx. 70 g	approx. 70 g	approx. 75 g	approx. 85 g
	Controller	approx. 50 g			
	Overall system	approx. 120 g	approx. 120 g	approx. 125 g	approx. 135 g
Typ. spring forces [7]	SMR	1.3 N	0.8 N	1 N	0.7 N
	MMR	1.55 N	1.5 N	1.9 N	1.9 N
	EMR	2 N	2.5 N	3 N	3.5 N
Typ. service life		5 million cycles			

FSO = Full Scale Output
SMR = Start of measuring range, MMR = Mid of measuring range, EMR = End of measuring range
[1] Noise: AC RMS measurement via RC low-pass filter of the 1st order with fc = 5 kHz
[2] 200 repetitions; each repetition averaged over 100 values
[3] V_+ = 5 V: no voltage output available; current output: max. load 100 Ω; V_+ = 9 V: voltage output: 0.5 V ... 4.5 V or 0 V ... 5 V; current output: max. load 250 Ω
[4] Connection via interface module (see accessories)
[5] 0 V ≙ < 30 mV, 0 mA ≙ < 35 µA; with controllers including a current output, the output signal is limited to approx. 21 mA
[6] Mounting clamp included in delivery, see accessories
[7] Removing the bellows changes the spring forces

Article designation

DT	D	-5	-G8	-KE	-3	-CC3	-SA

-SA: Connection (axial): 5-pin SA connector M12
-CC3: Connection cable 3 m
-3: Linearity: 3 (±0.3 %)
-KE: Controller integrated in cable
-G8: Function: gauge
-5: Measuring range in mm
D: Excitation DC
DT: Principle: Differential Transformer (LVDT)

Accessories

Cables

IF7001	Single-channel USB/RS485 converter
PC5/5-IWT	Supply and output cable, 5 m

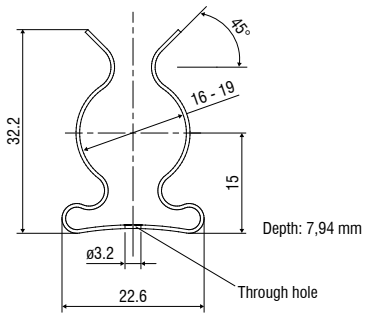
Interface modules

IF2030/ENETIP	DIN rail interface module for Ethernet/IP (multi-channel)
IF2030/PNET	DIN rail interface module for ProfiNet (multi-channel)
IF1032/ETH	Interface module for Ethernet/EtherCAT (single-channel)

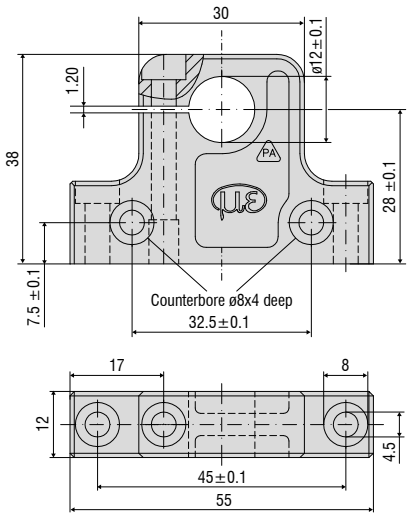
Mounting

Mounting clamp	for controller installation
MBS12/8 Mounting block	Sensor installation for circumferential clamping
MBS12/8 Adapter ring	for reduction to D8 (gauge)

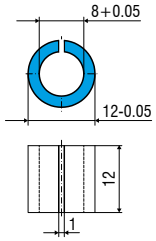
Mounting clamp



Mounting block MBS12/8



Adapter ring MBS12/8



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