








More Precision.

indu**SENSOR** // Linear inductive displacement sensors





-  **Proven LVDT technology**
-  **Measuring ranges $\pm 1 \dots \pm 10$ mm**
-  **Low cost especially with a large number of pieces**
-  **Sensor diameter of just $\varnothing 8$ mm**
-  **Models with pneumatic push**

LVDT gauge sensors DTA-xG8 are primarily used for the measurement and inspection of workpiece geometry (e.g. length, width, diameter, thickness, depth, height). Therefore, different measuring ranges from ± 1 mm to ± 10 mm are available. The gauges are particularly suitable for applications involving a large number of pieces.

These gauges have an axial cable outlet and are equipped with either a plain bearing-guided plunger and a return spring, or with a pneumatic push rod. Depending on the measuring object, different probe tips are available.

DTA gauges can be operated with every MSC controller. Depending on this controller, single-/dual-/multi-channel measurements are possible. In addition to the well-established analog output, modern fieldbuses are available for integration purposes.



Based on modern interfaces and multi-channel capability, the MSC controllers open up new fields of application.



Plunger and return spring

Article designation

DT	A-	5-	G8-	3-	CA-	V
Principle: Differential Transformer (LVDT)						
Excitation AC						
Measuring range in mm						
Function: gauge						
Linearity: 3 (± 0.3 %)						
Connection (axial): CA integral cable (3m)						
Gauge options: V: pneumatic push						



Model	DTA-1G8	DTA-3G8	DTA-5G8	DTA-10G8	DTA-1G8-V	DTA-3G8-V	DTA-5G8-V	DTA-10G8-V
Measuring range	±1 mm	±3 mm	±5 mm	±10 mm	±1 mm	±3 mm	±5 mm	±10 mm
Linearity	≤ ±3 μm	≤ ±9 μm	≤ ±15 μm	≤ ±30 μm	≤ ±3 μm	≤ ±9 μm	≤ ±15 μm	≤ ±30 μm
Repeatability ¹⁾	≤0.15 μm	≤0.45 μm	≤0.75 μm	≤1.5 μm	≤0.15 μm	≤0.45 μm	≤0.75 μm	≤1.5 μm
Temperature stability	≤ 250 ppm FSO/K							
Sensitivity	133 mV / mm/V	85 mV / mm/V	53 mV / mm/V	44 mV / mm/V	133 mV / mm/V	85 mV / mm/V	53 mV / mm/V	44 mV / mm/V
Excitation frequency	5 kHz	5 kHz	5 kHz	2 kHz	5 kHz	5 kHz	5 kHz	2 kHz
Excitation voltage	550 mV							
Connection	integrated cable (3 m) with open ends; axial cable outlet; drag-chain suitable; cable diameter of 3.1 mm; min. bending radii: fixed installation 25 mm, moving 38 mm, drag chain 47 mm							
Temperature range	-40 ... +80 °C							
Storage								
Operation	-20 ... +80 °C (without bellows); 0 ... 80 °C (with bellows)							
Pressure resistance	atmospheric pressure							
Shock (DIN EN 60068-2-27)	40 g / 6 ms in 3 axes, 1000 shocks each							
Vibration (DIN EN 60068-2-6)	±1.5 mm / 10 ... 58 Hz in 2 axes, 10 cycles each ±20 g / 58 ... 500 Hz in 2 axes, 10 cycles each							
Protection class (DIN EN 60529)	IP65 (with bellows); IP54 (without bellows)							
Material	Stainless steel (housing); FPM (bellows); PUR (cable sheath); PVC/PP (cable braids)							
Weight	approx. 70 g	approx. 70 g	approx. 75 g	approx. 85 g	approx. 70 g	approx. 70 g	approx. 80 g	approx. 85 g
Typical spring forces ²⁾	SMR	1.3 N	0.8 N	1 N	0.7 N	depending on air pressure		
	MMR	1.55 N	1.5 N	1.9 N	1.9 N			
	EMR	2 N	2.5 N	3 N	3.5 N			
Compatibility	MSC7401, MSC7802, MSC7602							
Typ. service life	5 million cycles							

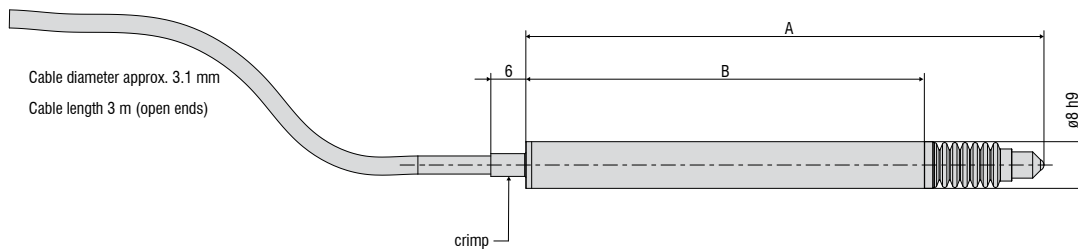
FSO = Full Scale Output

SMR = Start of measuring range, MMR = Mid of measuring range, EMR = End of measuring range

¹⁾ Averaging over 100 values; 200 repetitions

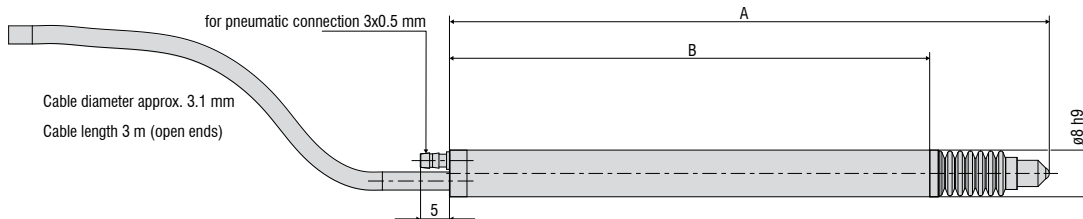
²⁾ Removing the bellows changes the spring forces

DTA-xG8-3-CA



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

DTA-xG8-3-CA-V



Modell	A (zero position)	B
DTA-1G8-3-CA-V	94.8 mm	76.3 mm
DTA-3G8-3-CA-V	102.8 mm	82.3 mm
DTA-5G8-3-CA-V	134.0 mm	105.3 mm
DTA-10G8-3-CA-V	171.0 mm	137.3 mm

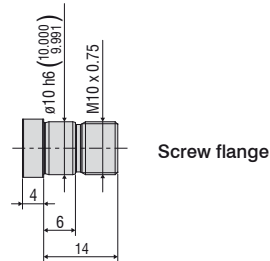
Dimensions in mm, not to scale

Sensor cables

- C701-3 Sensor cable, 3 m, with cable connector and tin-plated free ends
- C701-6 Sensor cable, 6 m, with cable connector and tin-plated free ends
- C701/90-3 Sensor cable, 3 m, with 90° cable connector and tin-plated free ends
- IF7001 Single-channel USB/RS485 converter for MSC7xxx

Service

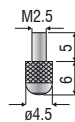
- Assembly of screw flange - DTA-xG8
- Connector assembly M9 and cable reduction XXXX mm - DTA-x
- Connector assembly M9 - DTA-x



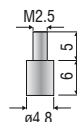
Probe tips

- Type 2 probe tip / hard metal
- Type 2 probe tip / plastics
- Type 2 probe tip / ruby
- Type 2 probe tip / steel
- Type 10 probe tip / steel
- Type 11 probe tip / steel
- Type 13 probe tip / steel

Standard probe tip: type 2



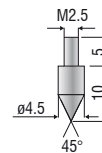
Option: type 10



Option: type 11

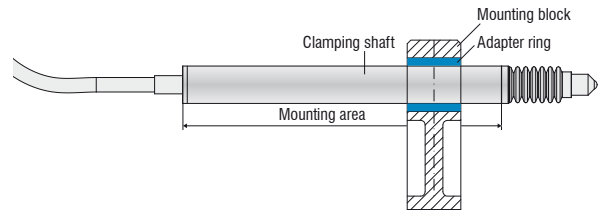


Option: type 13

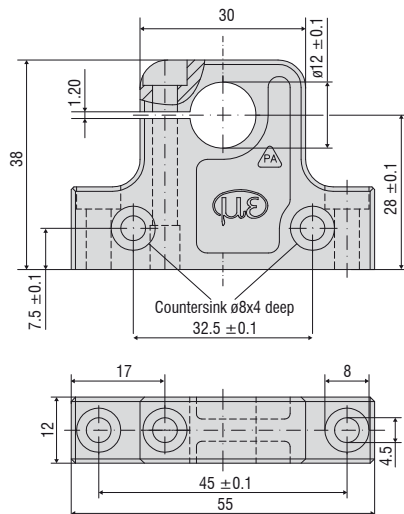


Sensor mounting

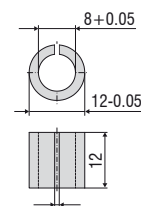
- MBS12/8 Mounting block
 - MBS12/8 Adapter ring
- Sensor mounting for circumferential clamping for reduction to D8 (gauge)



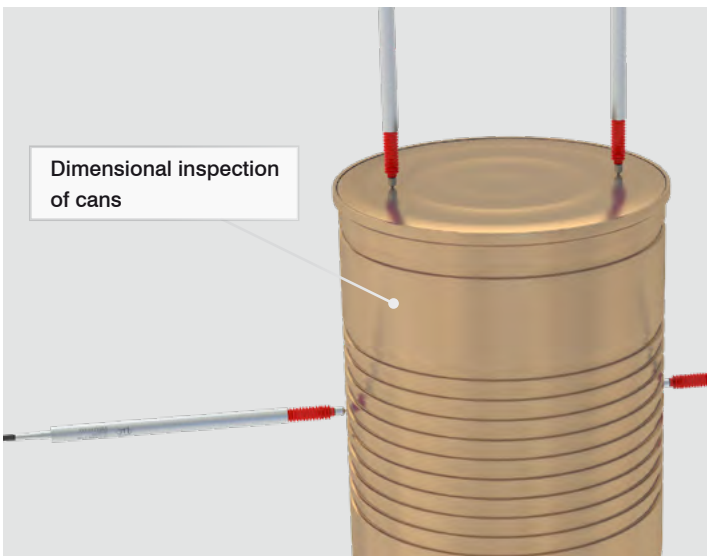
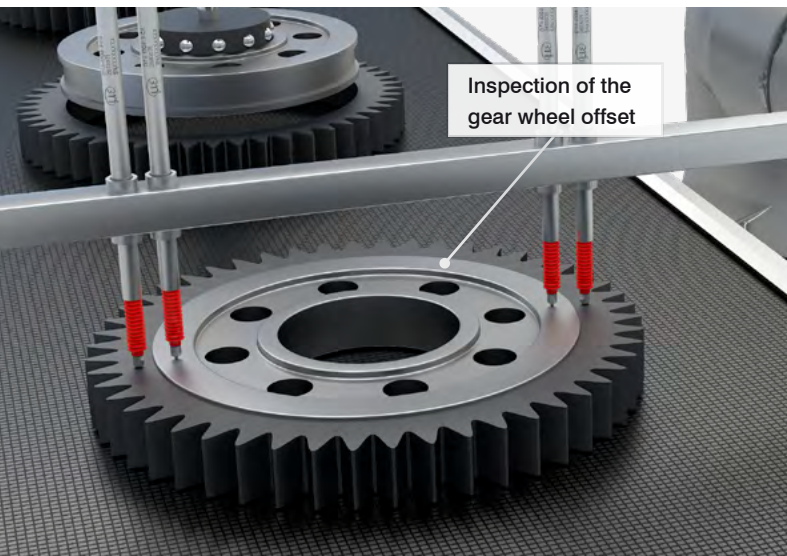
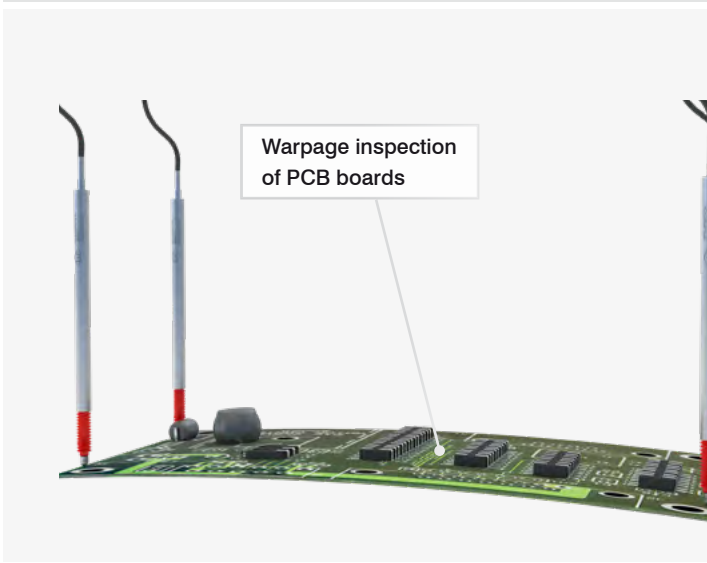
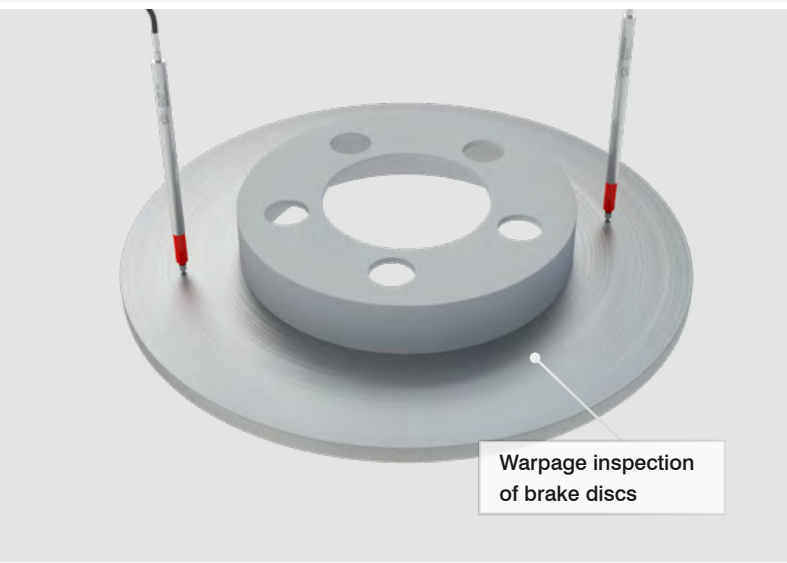
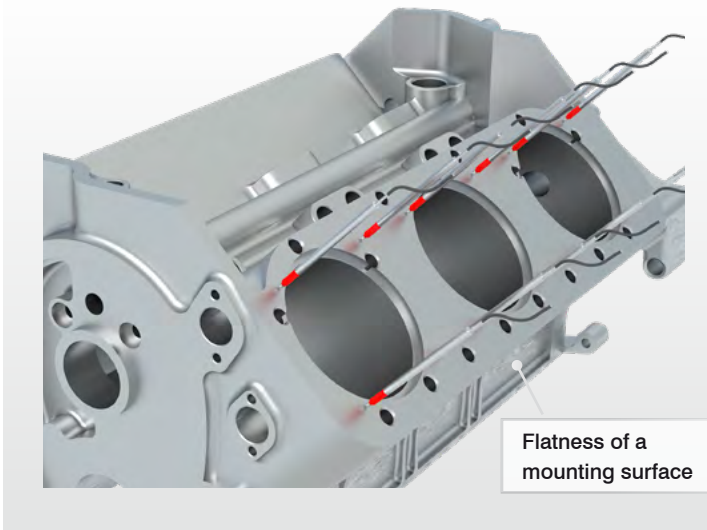
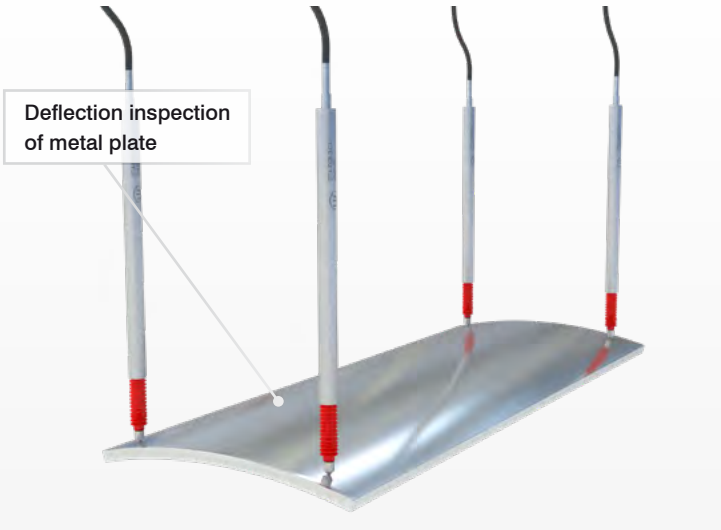
Mounting block MBS12/8



Adapter ring



Gauges from Micro-Epsilon have many possible fields of application. Due to different measuring ranges and configuration settings, the gauges are suitable for numerous measurement and inspection tasks. Combined with multi-channel controllers, the DTA gauges are often used for dimensional measurement and inspection tasks, e.g., in automated quality control, R&D and production monitoring.










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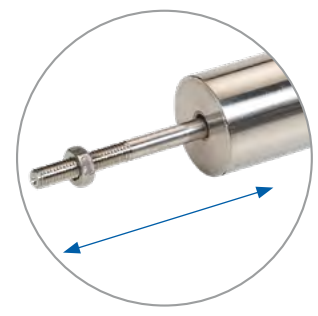
-  **Proven LVDT technology**
-  **Measuring ranges $\pm 1 \dots \pm 25$ mm**
-  **Extremely accurate also under difficult ambient conditions**
-  **Long-term stability**
-  **Robust design IP67**

LVDT displacement sensors have a plunger which moves freely in the sensor housing. The plunger is joined to the object by a thread to transfer the movement of the measuring object. The measurement process in the sensor takes place without contact and is therefore wear-free.

The high sensor resolution is only limited by the noise of the sensor controller. Another advantage of the symmetric LVDT sensors is their zero point stability. The sensors are supplied with an excitation frequency of 1 to 5 kHz depending on the measuring range and an excitation voltage of $0.4V_{eff}$. Adapted sensor controllers are available for this purpose.

The displacement sensors are primarily used to measure and monitor movements, displacements, positions, strokes, deflections, dislocations, etc. in vehicles, machines and systems.

With appropriate setting possibilities for the excitation frequency and excitation voltage, the sensors can also be operated with alternative controllers.



Freely moving plunger

Article designation

DT	A-	10-	D-	3-	CA-	W
Options (on request): W Welded sensor housing (water proof up to 5 bar) P Pressure-resistant sensor housing with tightness test (up to 100 bar) F Pressure-resistant mounting flange O-ring seal H High-temperature sensor models up to 200 °C with integral Teflon cable (only for sensor models with -CA/-CR connections)						
Axial connections			Radial connections			
CA integral cable (3m)			CR integral cable (3 m)			
SA plug-in connection			SR plug-in connection			
Linearity: 5 (± 0.5 %)		3 (± 0.3 %)		1.5 (± 0.15 %)		
Function: displacement sensor						
Measuring range in mm						
Excitation AC						
Principle: Differential Transformer (LVDT)						

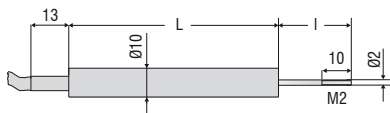


Model		DTA-1D	DTA-3D	DTA-5D	DTA-10D	DTA-15D	DTA-25D
Series		CA, SA	CA, SA	CA, SA	CA, SA	CA, SA, CR, SR	CA, SA, CR, SR
Measuring range		±1 mm	±3 mm	±5 mm	±10 mm	±15 mm	±25 mm
Linearity	≤ ±0.5 % FSO	-	-	-	-	-	≤ ±300 μm
	≤ ±0.3 % FSO	≤ ±6 μm	≤ ±18 μm	≤ ±30 μm	≤ ±60 μm	≤ ±90 μm	on request
	≤ ±0.15 % FSO	≤ ±3 μm	≤ ±9 μm	≤ ±15 μm	on request		-
Temperature stability ¹⁾	Zero	≤ 70 ppm FSO/K					
	Max. temp. error	≤ 150 ppm FSO/K					
Sensitivity		133 mV / mm/V	85 mV / mm/V	53 mV / mm/V	44 mV / mm/V	45 mV / mm/V	33 mV / mm/V
Excitation frequency		5 kHz			2 kHz	1 kHz	
Excitation voltage		550 mV					
Connection	CA/CR	integrated cable (3 m) with open ends; radial or axial cable outlet depending on series; cable diameter 4.6 mm; min. bending radius 20 mm (fixed installation)					
	SA/SR	5-pin connector; radial or axial output depending on series (see accessories for connection cable)					
Temperature range	Storage	-40 ... +80 °C					
	Operation	-20 ... +80 °C (optional up to 200 °C on request)					
Pressure resistance		atmospheric pressure (optional 5 bar or 100 bar on front side on request)					
Shock (DIN EN 60068-2-27)		40 g / 6 ms in 3 axes, 1000 shocks each 100 g / 6 ms in 3 axes, 3 shocks each					
Vibration (DIN EN 60068-2-6)		±1.5 mm / 10 ... 58 Hz in 2 axes, 10 cycles each; ±20 g / 58 ... 500 Hz in 2 axes, 10 cycles each					
Protection class (DIN EN 60529)		IP67 (plugged)					
Material		Stainless steel (housing)					
Weight	Sensor CA/CR	approx. 90 g	approx. 100 g	approx. 100 g	approx. 105 g	approx. 195 g	approx. 230 g
	Sensor SA/SR	approx. 15 g	approx. 20 g	approx. 25 g	approx. 30 g	approx. 106 g	approx. 145 g
	Plunger	approx. 2 g	approx. 3 g	approx. 4 g	approx. 5 g	approx. 12 g	approx. 17 g
Compatibility		MSC7401, MSC7802, MSC7602					

FSO = Full Scale Output

¹⁾ Determined according to box method (-40 ... +80 °C)

Sensor types with measuring range up to ±10 mm (inner diameter 2.7 mm; plunger diameter 2 mm)

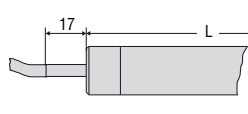


Type - CA
with integral cable

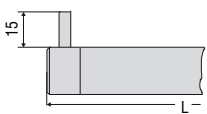


Type - SA
with axial plug connection

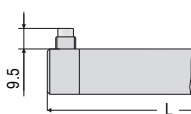
Sensor types with measuring range ±15 mm and ±25 mm (inner diameter 4.8 mm; plunger diameter 4 mm)



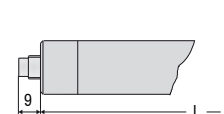
Type - CA
with integral cable



Type - CR
with integral cable (radial)



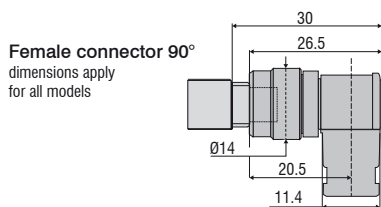
Type - SR
with radial plug connection



Type - SA
with axial plug connection

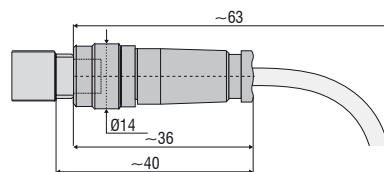
Basic model	DTA-1D-		DTA-3D-		DTA-5D-		DTA-10D-		DTA-15D-				DTA-25D-			
	CA	SA	CA	SA	CA	SA	CA	SA	CA	CR	SA	SR	CA	CR	SA	SR
Connection	CA	SA	CA	SA	CA	SA	CA	SA	CA	CR	SA	SR	CA	CR	SA	SR
Housing length L	40 mm	40 mm	57 mm	57 mm	73 mm	73 mm	87 mm	87 mm	106.5 mm				143.5 mm			
Plunger length l ¹⁾	19 mm		29 mm		30 mm		35 mm		51 mm				62 mm			
Housing diameter	10 mm								20 mm							

¹⁾ Plunger in zero position (±10% of measuring range ±1 mm)



Female connector 90°
dimensions apply for all models

Female connector
dimensions apply for all models



Dimensions in mm, not to scale

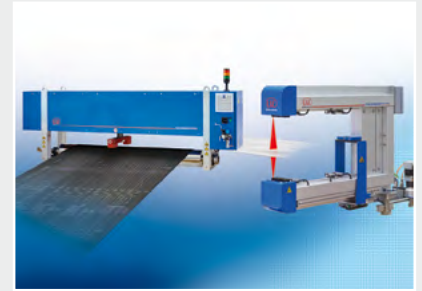
Sensors and Systems from Micro-Epsilon



Sensors and systems for displacement, distance and position



Sensors and measurement devices for non-contact temperature measurement



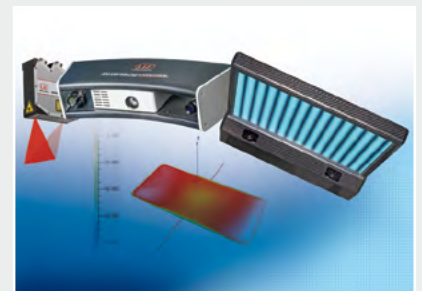
Measuring and inspection systems for metal strips, plastics and rubber



Optical micrometers and fiber optics, measuring and test amplifiers



Color recognition sensors, LED analyzers and inline color spectrometers



3D measurement technology for dimensional testing and surface inspection