induSENSOR LVDT

- *Proven LVDT technology*
- *Measuring ranges ± 1 … ± 25 mm*
- *Extremely accurate also under difficult ambient conditions*
- *Long-term stability*
- *Wear-free measurement*

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 measurement object. The measurement process in the sensor takes place without contact and is therefore wear-free.

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

The high sensor resolution is limited only by the noise in the sensor electronics. A further advantage of the symmetrically constructed sensors in the LVDT series is the zero point stability of the systems. The sensors are supplied with an excitation frequency of 1 to 5 kHz depending on the measuring range and an excitation amplitude of 2.5 to 5 V eff. Matched sensor electronics are available in this respect. With appropriate setting possibilities for the excitation frequency and amplitude, the sensors can also be operated with alternative electronics.

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 sensors 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 (3 m)	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

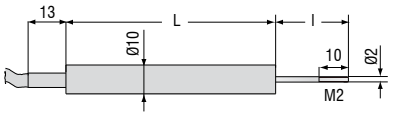
Excitation AC

Principle: Differential Transformer (LVDT)

Model		DTA-1D-		DTA-3D-		DTA-5D-		DTA-10D-		DTA-15D-				DTA-25D-			
Connection		CA	SA	CA	SA	CA	SA	CA	SA	CA	CR	SA	SR	CA	CR	SA	SR
Measuring range		± 1 mm		± 3 mm		± 5 mm		± 10 mm		± 15 mm				± 25 mm			
Linearity	Standard ± 0.5 %	-		-		-		-		-				300 μm			
	Standard ± 0.3 %	6 μm		18 μm		30 μm		60 μm		90 μm				on request			
	Option ± 0.15 %	3 μm		9 μm		15 μm		on request						-			
Excitation frequency		5 kHz						2 kHz		1 kHz							
Excitation amplitude		5 V_{eff}								2.5 V_{eff}							
Sensitivity		133 mV/Vmm		85 mV/Vmm		53 mV/Vmm		44 mV/Vmm		45 mV/Vmm				33 mV/Vmm			
Temperature range		-20 ... +80 °C [1]															
Storage temperature		-40 ... +80 °C															
Temperature stability [3]	Zero	70 ppm/°C															
	Max. temp. error	150 ppm/°C															
Sensor housing		stainless steel including magnetic shielding															
Minimum cable bending radius		20 mm															
Outer diameter (cable)		~4.6 mm															
Protection class		IP 67 [2]															
Shock		40 g, 1000 shocks / axis															
		100 g, 3 shocks / direction															
Vibration		10 ... 58 Hz ± 1.5 mm / 58 ... 500 Hz ± 20 g															
Suitable controller		MSC7401 (pages 10 - 11)															

FSO = Full Scale Output
[1] Higher temperatures on request; [2] Higher pressures on request
[3] Determined according to box method (-40 ... +80 °C)

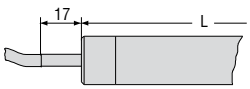
Sensor types with measuring range up to ± 10mm (inner diameter 2.7 mm; plunger diameter 2 mm)



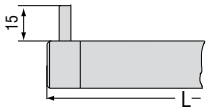
Type-CA with integral cable

Type-SA with axial plug connection

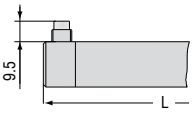
Sensor types with measuring range ± 15mm and ± 25mm (inner diameter 4.8 mm; plunger diameter 4 mm)



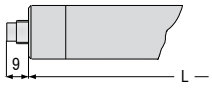
Type - CA
with integral cable



Type - CR
with integral cable (radial)



Type - SR
with radial plug connection

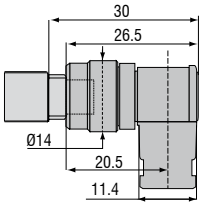


Type - SA
with axial plug connection

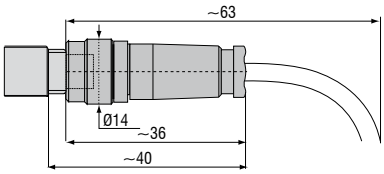
Basic model	DTA-1D-		DTA-3D-		DTA-5D-		DTA-10D-		DTA-15D-				DTA-25D-			
Connection	CA	SA	CA	SA	CA	SA	CA	SA	CA	CR	SA	SR	CA	CR	SA	SR
Housing length L	40 mm	40 mm	57 mm	57 mm	73 mm	73 mm	87 mm	87 mm	106.5 mm				143.5 mm			
Plunger length l [1]	19 mm		29 mm		30 mm		35 mm		51 mm				62 mm			
Housing diameter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



induSENSOR LDR

- *Wear-free and maintenance-free*
- *Temperature stability*
- *Operating temperature range up to 160 °C*
- *Compact design – short installation length*
- *Small sensor diameter*
- *High measurement signal quality*

The specific sensor configuration of the LDR series of linear displacement sensors is characterized by its short, compact design and small diameter. Three connections are required as an interface to the sensor. The compact design and the small sensor diameter facilitate the installation of the measuring systems in locations where space is restricted.

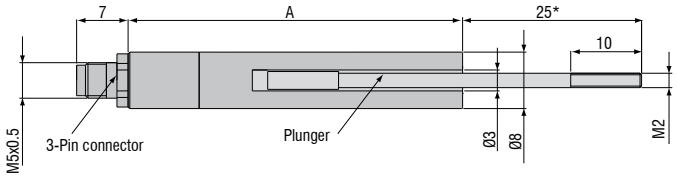
Typical applications

Low-cost LDR sensors are also particularly suitable for large-scale installation under restricted spatial conditions and in industrial environments with a high measuring rate.

Model		LDR-10-		LDR-25-		LDR-50-	
Connection		SA	CA	SA	CA	SA	CA
Measuring range		10 mm		25 mm		50 mm	
Measuring principle		LDR - sensor					
Linearity		typ. ± 0.30 % FSO		typ. ± 0.35 % FSO		typ. ± 0.5 % FSO	
		± 0.030 mm		± 0.088 mm		± 0.35 mm	
		max. ± 0.50 % FSO				max. ± 0.70 % FSO	
Excitation frequency		16 kHz		12 kHz		8 kHz	
Excitation amplitude		1 V_{eff}		1 V_{eff}		2.6 V_{eff}	
Sensitivity		51 mV/Vmm		21 mV/Vmm		5.5 mV/Vmm	
Temperature range	SA	Storage: -40 ... +80 °C / Operation: -15 ... +80 °C					
	CA	Storage: -40 ... +160 °C / Operation: -40 ... +160 °C					
Temperature stability [1]	Zero	30 ppm / °C				40 ppm / °C	
	Max. temp. error	100 ppm / °C				150 ppm / °C	
Housing (material)		ferromagnetic stainless steel					
Weight sensor (without plunger)		9 g	24 g	14 g	28 g	23 g	37 g
Weight (plunger)		1.5 g		2.2 g		3.5 g	
Minimum bending radius (sensor cable fixed/moved)		8 / 15 mm	10 / 30mm	8 / 15 mm	10 / 30mm	8 / 15 mm	10 / 30mm
Outer diameter (sensor cable)		3.1 mm	1.8 mm	3.1 mm	1.8 mm	3.1 mm	1.8 mm
Protection class		IP67					
Shock		40 g, 3000 shocks / axis					
		100 g radial, 300 g axial					
Vibration		5 ... 44 Hz ± 2.5 mm / 44 ... 500 Hz ±20 g					
Electrical connection	SA	3-pin plug-in connection (accessory cable, article 0157047/047, 3 or 5 m)					
	CA	integral axial cable (shielded), 2 m					
Suitable controller		MSC7401 (pages 10 - 11)					

FSO = Full Scale Output SA = connector axial CA = cable axial
[1] Determined according to box method (-40 ... +160 °C)

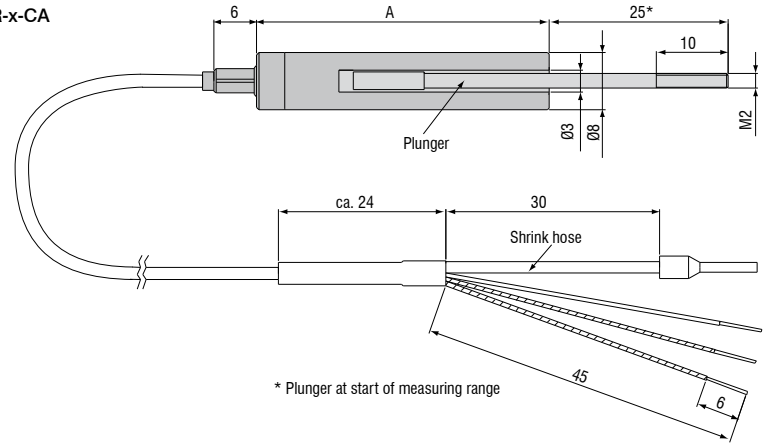
LDR-x-SA



* Plunger at start of measuring range

Model	A
LDR-10-SA	47 mm
LDR-25-SA	73 mm
LDR-50-SA	127 mm

LDR-x-CA



* Plunger at start of measuring range

Model	A
LDR-10-CA	41 mm
LDR-25-CA	67 mm
LDR-50-CA	121 mm