

# High-precision Incremental Displacement Sensor

## Series 8738

Code:	8738 EN
Delivery:	ex stock
Warranty:	24 months

CAD data 2D/3D for this sensor:  
Download directly at [www.traceparts.com](http://www.traceparts.com)  
Info: refer to data sheet 80-CAD-EN



- Measuring ranges between 0 ... 5 mm and 0 ... 100 mm
- Accuracy up to  $\pm 0.5 \mu\text{m}$
- Diameter up to 8 mm
- Vibration resistant and dust proof
- High protection class up to IP66

### Application

Incremental magnetic measuring heads offer maximum precision over the full range of measurements. As a result of the magnetic operating principle and the robust mechanical construction, they are insensitive to soiling and are therefore ideally suited to use in production facilities.

Thanks to the high quality of their measurements, their high protection and long service life, these sensors are used in many technologies (industry, research, development etc.).

Typical applications include:

- ▶ Monitoring both slow and fast movements between machine parts
- ▶ Measurements of position and positional changes in components and structural foundations, of servo regulators, valve and robot controllers
- ▶ Measurement of growth, and so on

### Description

The incremental displacement sensors are based on a magnetic principle: consisting of a magnetic scale and a multi-slot reading head that responds to changes in magnetic flux, they detect linear movements with high precision and resolution.

The scale of ferromagnetic alloy – or magnetic tape – is magnetized by an alternating magnetic field with a pole spacing of 0.2 mm. A special recording head and a laser measurement system guarantee that the graduations are very precise. From the magnetic pattern on the scale, the multi-slot reading head generates a signal proportional to the movement.

The analog signal generated by the reading head is electronically divided and digitized. Changes in length can be measured with a resolution of from  $1 \mu\text{m}$  down to  $0.1 \mu\text{m}$ .

Thanks to its slim shape with a diameter of 8 mm and its high accuracy over the full range of measurements, model **8738 DK** is particularly suitable for use in multi-point measuring equipment. The spindle and spindle guide are protected from dust by a bellow.

## Technical Data

Order Code	Measuring Range	Dimensions [mm]									Resolution [μm]	Accuracy [μm]	Mass of Sensor without Cable [kg]	Protection Class
		L	L1	L2	L3	øD1	øD2	KA	øW	TS				
8738-DK805R5	0 ... 5 mm	82	22.3	11	49.5	8	8	-	-	8.1	0.5	1.5	0.02	IP66
8738-DK812R5	0 ... 12 mm	109.7	33	19.5	57.2	8	8	-	-	8.1	0.5	1.5	0.03	IP66
8738-DK25PR5	0 ... 25 mm	179.5	38.5	33.8	107.2	20	20	20	6	12	0.5	2	0.3	IP64
8738-DK830R	0 ... 30 mm	195.2	39.6	45.7	109.9	8	12	17	4	8.1	0.1	1.3	0.07	IP53
8738-DK50PR5	0 ... 50 mm	286	63	44	179	20	20	20	6	12	0.5	2	0.36	IP64
8738-DK100PR5	0 ... 100 mm	443.5	114	38.5	291	20	25	20	8	12	0.5	4	0.63	IP64

### Electrical values

Excitation voltage :	5 V ± 5 %
Output signal:	A/B/Z phasing signal (line driver RS422)
Current consumption:	max. 300 mA
Power consumption:	1 W

### Environmental conditions

Nominal temperature range:	from 0 °C to 50 °C
Storage temperature range:	from -20 °C to 60 °C
Influence of temperature:	0.012 μm/K

### Mechanical values

Maximum speed of response:	1 m/s
Rod drive:	spring force (compressed air, vacuum optional)
Protection class without interpolator and connector:	model 8738-DK IP64
Weight:	< 0.6 kg
Bending radius:	with flexible mounting position < 50 mm with fix mounting position < 20 mm
Vibration resistance:	100 m/s
Shock resistance:	1000 m/s
Reference marker:	1
Displacement force (horizontal):	< 0.4 ± 0.25 N
Durability:	5 million cycles

### Electrical connections:

Shielded cable, length 2.5 m (model 8738-DK830R, length 2.4 m, interpolation box and 8 pin connector, (DK series) for 9140.

Wiring:	Output signal	8738-DK	8738-CE-22
	+5 V	purple	red
	0 V/GND	black	white
	A	blue	blue
	*A	yellow	yellow
	B	orange	orange
	*B	grey	grey
	Z	red	green
	*Z	white	purple

### Mounting instructions

It is important to ensure that the sensor housing is not too tightly clamped when mounting. Although the shaft has been specially hardened, excessive tightening torques should be avoided (max. 0.06 Nm).

The accuracy of the measurement depends on the parallelism achieved during assembly; the mounting bracket should be designed and machined in such a way that the parallelism of the measuring head to the surface achieved during assembly is kept within 0.3 mm/100 mm.

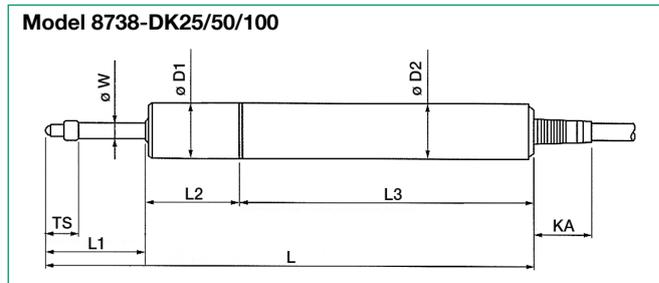
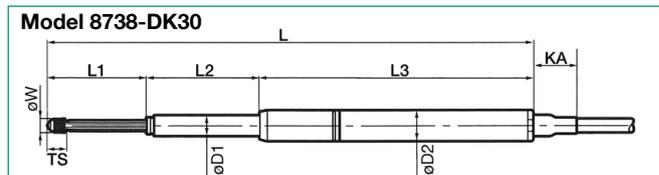
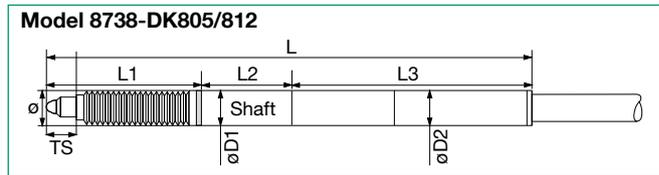
### Note:

For measurements where the required precision is lower, the DT series offers a low-cost alternative; measuring ranges: 12 mm or 32 mm (5 μm resolution) on request.

DT series  
(Technical data on request)



### Dimensional drawing



### The CAD drawing (3D/2D) for this sensor can be imported online directly into your CAD system.

Download via [www.burster.com](http://www.burster.com) or directly at [www.traceparts.com](http://www.traceparts.com). For further information about the burster traceparts cooperation refer to data sheet 80-CAD-EN.

### Order Information:

Incremental displacement sensor, measurement range 5 mm, straight cable outlet, 1.5 μm accuracy **Model 8738-DK805R5**

Incremental displacement sensor, measurement range 25 mm, straight cable outlet, 2 μm accuracy **Model 8738-DK25PR5**

### Accessories

Probe tip with carbide ball, ø 3 mm, M 2.5 (part of delivery)

**Model 8738-Z001**

Indicator:

Digital display 9140, DIGIFORCE® 9307  
please refer to section 9 of the catalog.

### Connecting cable

Connecting cable, length 3 m, for connection to DIGIFORCE® 9307 **Model 99163-8738-CE22-03**

Connecting cable for incremental displacement sensor 8738-DK, length 3 m, **Model 8738-CE22-03**

Connecting cable, length 3 m, for connection to Digital Display 9140 **Model 8738-CK22-03**

### Options

Resolution 0.1 μm, accuracy 1 μm and flange **Model 8738-DK805R**

Pneumatic lining (Push):

**Model 8738-DK812VR**

The rod is pushed inside by spring forces and pushed outside by compressed air.  
minimum pressure: 0.25 bar  
maximum pressure: 0.45 bar

Vacuum lifting (Pull):

**Model 8738-DK805LR**

The rod is pushed inside by spring forces and pulled outside by vacuum.  
minimum vacuum: 0.25 bar