High-precision Incremental Displacement Sensor
Series 8738

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 µm down to 0.1 µm.
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.

- Measuring ranges between 0 ... 5 mm and 0 ... 100 mm
- Accuracy up to ± 0.5 µm
- Diameter up to 8 mm
- Vibration resistant and dust proof
- High protection class up to IP66
Technical Data

**Dimensional drawing**

**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

**Mechanical values**
- Influence of temperature: (coefficient of thermal expansion of steel) 12 x 10^{-6} /K
- Rod drive: spring force (compressed air, vacuum optional)
- Protection class without interpolator and connector: model 8738-DK IP64

**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
    - Model 8738-Z001
  - Indicator: Digital display 9140, DIGIFORCE® 9307
    - Please refer to section 9 of the catalog.
  - Connecting cable
    - Model 99163-8738-CE22-03
    - Model 8738-DK25/50/100

**Protection Class**
- IP66
- IP64
- IP53

**Technical Data**

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The CAD drawing (3D/2D) for this sensor can be imported online directly into your CAD system.
For further information about the burster traceparts cooperation refer to data sheet 80-CAD-EN.

**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.