LVDT Displacement Sensor
With IN-LINE Amplifier
Model 8739

Application
Inductive displacement sensors of this series measure linear displacements and indirectly all mechanical values convertible into displacements by additional equipment (i.e. tension and compression forces, extension, torque, vibration). The sensor body equipped with a connector has an outer diameter of only 8 mm and therefore is especially well suitable for the integration in dimensionally restricted structures.

Typical application fields are displacement and extension measurements on:
- Machines
- Servo systems
- Motor vehicles
- Test benches
- Production plants

Description
The cylindrical case made of stainless steel, houses a differential transformer (LVDT). It consists of a primary and two secondary coils with axially moveable core. A displacement of this core changes the magnetic induction of the coils. The IN-LINE carrier frequency amplifier converts the displacement into a direct proportional electrical DC voltage.

The transducer is constructed as a probe at which within the measuring range a spring pushes the probe tip towards the measuring object. Bellows protect the mechanical guidance of the probe tip against pollution and splash water.

The IN-LINE amplifier is integrated in the connector cable and adjusted specifically to the sensor. Both components form a unit while they can be separated for mounting purposes (miniature plug connection at the transducer). The use of not harmonized components may lead to increased measurement errors. For the IN-LINE amplifier version the sensor body is galvanically isolated from the excitation and from the measuring signal. Lateral forces decrease the durability.

- Ranges from 0 ... 1 mm to 0 ... 10 mm
- Non-linearity 0.25 % F.S.
- Sensor diameter 8 mm
- Vibration and wear free
- Output 0 ... 10 V
- Sensor without IN-LINE amplifier
- Sensor with IN-LINE amplifier or USB interface
### Technical Data

#### Electrical values

- **Excitation voltage (protected against wrong polarity):** 13.5 ... 28 V DC
- **Current input:** < 30 mA
- **Output voltage of measuring range:** (standard): 0 ... +10 V
- **Ripple of output voltage:** approx. 20 mV
- **Internal carrier frequency:** 4 kHz
- **Output resistance:** 1 kΩ
- **Load resistor:** recom. > 1 MΩ

#### Environmental conditions

- **Operation temperature range (incl. amplifier):** -20 °C ... 80 °C
- **Nominal temperature range:** -20 °C ... 80 °C
- **Influence of temperature:** 0.03 % F.S./K

#### Mechanical values

- **Non-linearity:** < 0.25 % F.S.
- **Non-repeatability:** ± 0.1 % F.S.
- **Hysteresis:** ± 0.1 % F.S.
- **Driving rod:** guided by ball-bearings
- **Probe tip (included in scope of delivery):** thread M 2.5
- **Case material of sensor body:** ST 25, nickel-plated
- **Case material IN-LINE amplifier:** Aluminium
- **Protection class:** according to EN 60529 Model 8739 IP60

#### Model 8739

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Measuring Range</th>
<th>Dimensions [mm]</th>
<th>Cut-Off Frequency [Hz]</th>
<th>Tip Force at Full Scale max. [N]</th>
<th>Weight [g]</th>
</tr>
</thead>
<tbody>
<tr>
<td>8739-5001-V501</td>
<td>0 ... 1 mm</td>
<td>103 A 97.5 B 15.5 H 4</td>
<td>100</td>
<td>2.3</td>
<td>25</td>
</tr>
<tr>
<td>8739-5002-V501</td>
<td>0 ... 2 mm</td>
<td>103 A 97.5 B 15.5 H 4</td>
<td>100</td>
<td>2.3</td>
<td>25</td>
</tr>
<tr>
<td>8739-5005-V501</td>
<td>0 ... 5 mm</td>
<td>140 A 130 B 23 H 7</td>
<td>100</td>
<td>2.3</td>
<td>25</td>
</tr>
<tr>
<td>8739-5010-V501</td>
<td>0 ... 10 mm</td>
<td>146 A 140 B 27 H 11</td>
<td>100</td>
<td>3.3</td>
<td>25</td>
</tr>
</tbody>
</table>

#### Model 8739 with out IN LINE Amplifier

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>8739-5001-V000</td>
<td>0 ... ± 0.5 mm</td>
<td>106 mV/V/mm</td>
<td>2</td>
<td>5</td>
<td>10</td>
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<tr>
<td>8739-5002-V000</td>
<td>0 ... ± 1 mm</td>
<td>106 mV/V/mm</td>
<td>2</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>8739-5005-V000</td>
<td>0 ... ± 2.5 mm</td>
<td>62 mV/V</td>
<td>2</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>8739-5010-V000</td>
<td>0 ... ± 5 mm</td>
<td>62 mV/V</td>
<td>2</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

#### Diagrams

- **LVDT Sensor**
- **IN-LINE Amplifier**
- **Clamp and fixing bracket**
- **Dimensional drawing model 8739**
- **The CAD drawing (3D/2D) for this sensor can be imported online directly into your CAD system.**

### Order Information

Inductive displacement sensor with measuring range 0 ... 5 mm including IN-LINE amplifier 0 ... +10 V analog output **Model 8739-5005-V501**

**Inductive displacement sensor with measuring range 0 ... 2 mm** **Model 8739-5002-V000**

### Accessories

Clamp for model 8739 **Model 8739-Z005**

Fixing bracket for model 8739 **Model 8739-Z003**

Threaded sleeve **Model 8739-Z004**

Connector 9 pin Min-D for model **Model 9900-V209**

Connector 12 pin suitable to burster desktop devices **Model 99004**

### Option

V302: Sensor housing with fixing thread M24x1.5x45 including two nuts (refer to mounting advice). The thread sleeve is mounted flush to the housing.

Inductive sensor with current output 4-20 mA, on request.

Inductive displacement sensor with USB interface and evaluation software (for more technical data please refer to data sheet 9205)

### Manufacturer Calibration Certificate (WKS)

Standard manufacturer calibration raising in 20 % increments, with or without indicator.