# Potentiometric Displacement Sensors

## Models 8710, 8711

| | |
|---|---|
| Code: | 8710 EN |
| Delivery: | ex stock |
| Warranty: | 24 months |


Model 8711

Model 8710

- **Measurement ranges 0 ... 25 mm to 0 ... 150 mm**
- **Non-linearity: max. ± 0.05 %**
- **Duration: $10^8$ operations**
- **Displacement speed: up to 10 m/s**
- **Drive free of lateral forces caused by ball joint coupling**
- **Integrated cable or plug connection**

8710 EN

### Application

Displacement sensors models 8710 and 8711 with resistance tracks made of conductive plastic material are designed for a direct and accurate measuring of mechanical displacements. A special ball joint coupling is mountable on both ends of the driving rod. Because of this the sensor may be used free of clearance or lateral forces also with angular or parallel misalignment between sensor and measuring device.
A special multi-fingered slider provides a good electrical contact also at high adjustment speeds or vibrations.

Areas of application are:
- ► Electromagnets
- ► Switch and button deflections
- ► Pneumatic cylinders
- ► Press-fits (longitudinal press-fits)
- ► Hydraulic cylinders
- ► Measurements of deformation and bending
- ► Length tolerances
- ► Feeding paths

### Description

Due to the technology employed in potentiometric displacement sensors, they always operate with a sliding contact system. Special processes are applied to give the resistance tracks low friction, low tendency to stick/slip, resistance to abrasion and long-term stability.
The driving rods are guided in long-life, low-friction sliding bearings with close tolerances; this results in highly precise measurements. Lateral forces reduce the service life and can be avoided by using, for instance, ball joint couplings, included in the burster product range.
Due to the pump effect, the driving rod has double sliding bearings.

### Mounting

The sensor is mounted at the left and right longitudinal slot by four mounting angles.

These slots (W = 2.2 mm, D = 1.6 mm) are closed at the side of the electrical connector.

## Technical Data

* without mounting parts ** total mechanical deflection

| Order Code | Measuring Range [mm] | Non Linearity * | Dimensions [mm] A | B ** | C | Dissipation at 40 °C (0W at 120 °C) | Total Weight | Moveable Weight |
|---|---|---|---|---|---|---|---|---|
| 8710 - 25 | 0 ... 25 | ± 0.2 % F.S. | 63 | 30 | 107 | 0.6 W | 83 | 32 |
| 8710 - 50 | 0 ... 50 | ± 0.1 % F.S. | 88 | 55 | 157 | 1.2 W | 102 | 40 |
| 8710 - 75 | 0 ... 75 | ± 0.1 % F.S. | 113 | 80 | 207 | 1.8 W | 121 | 48 |
| 8710 - 100 | 0 ... 100 | ± 0.1 % F.S. | 138 | 105 | 257 | 2.5 W | 140 | 56 |
| 8710 - 150 | 0 ... 150 | ± 0.1 % F.S. | 188 | 155 | 357 | 3.6 W | 178 | 72 |
| 8711 - 25 | 0 ... 25 | ± 0.2 % F.S. | 63 | 30 | 107 | 0.6 W | 83 | 32 |
| 8711 - 50 | 0 ... 50 | ± 0.1 % F.S. | 88 | 55 | 157 | 1.2 W | 102 | 40 |
| 8711 - 75 | 0 ... 75 | ± 0.1 % F.S. | 113 | 80 | 207 | 1.8 W | 121 | 48 |
| 8711 - 100 | 0 ... 100 | ± 0.1 % F.S. | 138 | 105 | 257 | 2.5 W | 140 | 56 |
| 8711 - 150 | 0 ... 150 | ± 0.05 % F.S. | 188 | 155 | 357 | 3.6 W | 178 | 72 |

### Electrical values

Resistance: measurement range 25 mm 1 kΩ; measurement ranges 50 ... 150 mm 5 kΩ

Tolerance of resistance: ± 20 %

Max. voltage: measurement range 25 mm 25 V DC; measurement ranges 50 ... 150 mm 60 V DC

Operating current in slider circuit: recommended < 0.1 µA; maximum 10 mA
(> 0.1 µA: negative influence to linearity and duration)

Dissipation: refer to table

Insulation resistance: > 100 MΩ at 500 V DC, 2 s, bar

Voltage resistance: < 100 µA at 500 V AS, 50 Hz, 2 s, 1 bar

### Environmental conditions

Operation temperature range: - 30 °C ... 100 °C

Storage temperature range: - 50 °C ... 120 °C

Influence of temperature:
to resistance - 200 ± 200 ppm/°C
to output voltage < 1.5 ppm/°C

### Mechanical values

Non-linearity: refer to table

Resolution: 0.01 mm

Displacement force, horizontal: ≤ 0.3 N

Displacement speed: ≤ 10 m/s

Vibration resistance: 5 ... 2000 Hz, $A_{max}$ = 0,75 mm, $a_{max}$ = 20 g

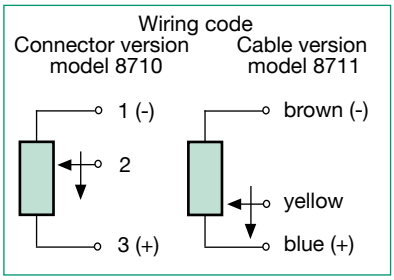
Shock resistance: 50 g, 11 ms

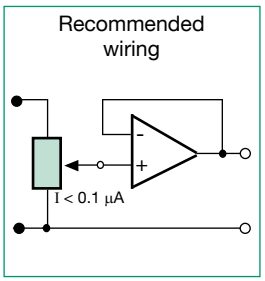
Radial clearance of driving rod: ≤ 0.015 mm

Flexibility of ball joint coupling: parallel ± 0.5 mm; angle ± 10 °

Protection class: acc. to EN 60529 IP40

Electrical connection:
model 8710 plug connection, 5 pin
(Mating connector model 9991 refer to accessories)
model 8711 integrated connection cable, length 1 m, cross section 4 mm



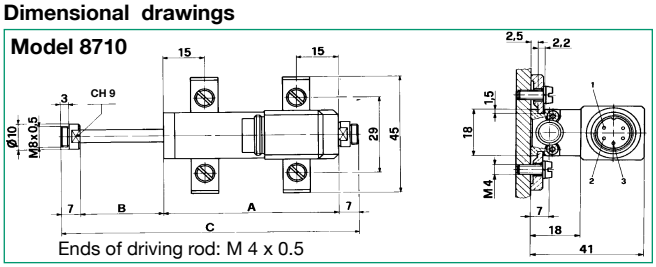




**Important:**
The excellent characteristics of the sensor are evident, if the slider load in the voltage divider is < 0.1 µA. If the measurement chain requires higher currents, an operational amplifier should be used, connected as a voltage follower (I < 0.1 µA) (see diagram above).

**Mounting:** with two 2 axial moveable clips, refer to diagram (in scope of delivery)

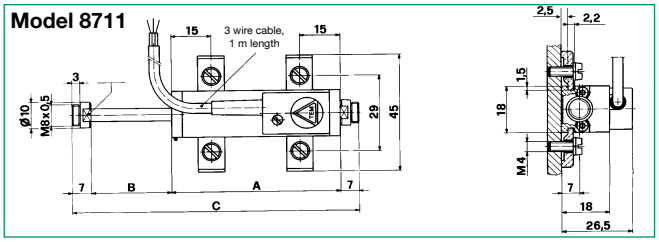
### Dimensional drawings

**Model 8710**




Ends of driving rod: M 4 x 0.5

**Model 8711**



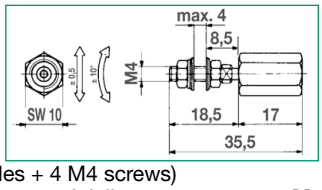

**The CAD drawing (3D/2D) for this sensor can be imported online directly into your CAD system.**
Download via www.burster.com or directly at www.traceparts.com. For further information about the burster traceparts cooperation refer to data sheet 80-CAD-EN.

## Order Information

Potentiometric displacement sensor
measurement range 100 mm with cable 1 m **Model 8711-100**

## Accessory

**Ball joint coupling**
1 unit is included in scope of delivery




**Model 8702**

Mounting set (4 angles + 4 M4 screws)
1 set is included in scope of delivery **Model 8710-Z001**

### for Model 8710

Mating connector (coupling socket 5 pin)
(1 unit is included in scope of delivery) **Model 9991**

Mating connector (coupling socket 5 pin)
IP40, 90° angle **Model 9900-V590**

Connecting cable, length 3 m, one end open **Model 99130**

Connecting cable
suitable to burster desktop devices, length 3 m **Model 99132**

Connecting cable
length 3 m, for DIGIFORCE® 9310 **Model 99209-591A-0090030**

### for Model 8711

Connector 12 pin, for burster desktop devices **Model 9941**
Connector 9 pin, for DIGIFORCE® 9310 **Model 9900-V209**
Connector 5 pin, for extension **Model 99121**

Mounting of a connector to the sensor cable **Oder Code: 99004**
only for connection to SENSORMASTER model 9163
desktop version **Order Code: 99002**

Evaluation units and amplifiers like digital indicator 9180, amplifier 9243, USB sensor interface 9206 or DIGIFORCE®
**refer to section 9 of the catalog.**

## Manufacturers calibration certificate (WKS)

Calibration of the displacement sensor with or without evaluation electronics in 20 % increments of the measurement range (6 points).



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