Potentiometric Displacement Sensor

Miniature design

Model 8709

Code:	8709 EN
Delivery:	ex stock
Warranty:	24 months

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

- **Measurable displacements between 0 ... 25 mm and 0 ... 250 mm**
- **Linearity: max. ± 0.05 %**
- **Housing diameter 12.9 mm**
- **Service life: 10^8 movements**
- **Adjustment speed: up to 10 m/s**
- **Integrated cable 1 m**
- **Special versions: Coupling with ball joints or flange fastening by request**

8709 EN

Application

Potentiometric displacement sensors are used for direct, precise measurement of mechanical displacements. The mechanical parts of the measuring equipment must be set-up in such a way that the sliding shaft can move without play or lateral forces.
A special multi-finger slider ensures good contact even when the adjustment speed is high or in the presence of vibration. With its housing diameter of only 12.9 mm, the model 8709 is also suitable for highly compact structures.
The movable fastening clamps allow the user variable options for attaching the sensor without complication.
Optionally available adaptations, such as flange and ball joint versions, extend and complement the range of possible applications.

Typical fields of application include:

- ► Measuring the stroke on riveting machines
- ► Measuring insertion distances
- ► Offset measurements on bearings
- ► Spring travel measurements on axes
- ► Measurements of the movement of hoisting platforms
- ► Length measurements on pipe bending machines

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. Transverse forces reduce the service life and can be avoided by using, for instance, ball joint couplings.
Due to the pump effect, the driving rod has double sliding bearings. All the figures quoted in the data sheet for non-linearity, service life, reproducibility and temperature coefficient apply to the use of the sensor as a voltage divider with a maximum current of 0.1 µA.
A ball joint coupling (see accessories) at the end of the sliding shaft minimizes axial errors between the sensor and the equipment.

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Technical Data

Order Code	Range [mm]	Linearity* +1/-0	Resistance	Dissipation at 40 °C (0W at 120 °C)	Maximum Voltage	Length of Housing **A** [mm]	Distance of Holders (recom.) **B** [mm]	Total Movement **C** [mm]	Mass
8709-5025	0 ... 25	± 0.2 % F.S.	1 kΩ	0.5 W	20 V	74.5	42	30	45 g
8709-5050	0 ... 50	± 0.1 % F.S.	2 kΩ	1 W	40 V	99.5	67	55	55 g
8709-5075	0 ... 75	± 0.1 % F.S.	3 kΩ	1.5 W	60 V	124.5	92	80	65 g
8709-5100	0 ... 100	± 0.1 %F.S.	4 kΩ	2 W	60 V	149.5	117	105	75 g
8709-5125	0 ... 125	± 0.05 %F.S.	5 kΩ	2.5 W	60 V	174.5	142	130	85 g
8709-5150	0 ... 150	± 0.05 %F.S.	6 kΩ	3 W	60 V	199.5	167	155	95 g
8709-5200	0 ... 200	± 0.05 % F.S.	8 kΩ	3 W	60 V	249.5	217	205	115 g
8709-5250	0 ... 250	± 0.05 % F.S.	6 kΩ	3 W	60 V	299.5	267	255	135 g

* without mounting parts

Electrical values

Resistance: refer to table
Tolerance of resistance: ± 20 %
Maximum operating voltage: refer to table
Operating current in the slider circuit: recommended < 0.1 µA
maximum 10 mA
(> 0.1 µA: negative influence to linearity and durability)
Dissipation: refer to table
Insulation resistance: > 100 MΩ at 500 V=, 2 s, 1 bar
Electric strength: < 100 µA at 500 V~, 50 Hz, 2 s,1 bar

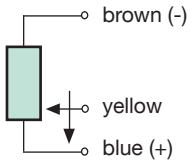
Environmental conditions

Operating 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

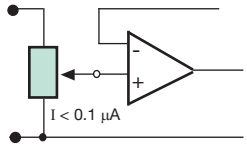
Mechanical values

Non-linearity: refer to table
Resolution: 10 µm
Displacement force, horizontal: ≤ 0.5 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
Protection class: acc. to EN 60529 IP60
Electrical connection: integrated, shielded cable, length 1 m, diameter 4 mm

Wiring code



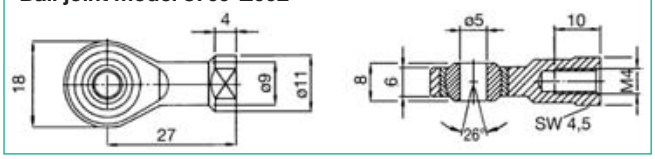
Recommended wiring



Important:
The outstanding properties of these sensors are only available when the slider current in the voltage divider is kept < 0.1 µA. If the measuring chain draws higher currents, the use of an operational amplifier as a voltage follower (I < 0.1 µA) is recommended (see drawing).

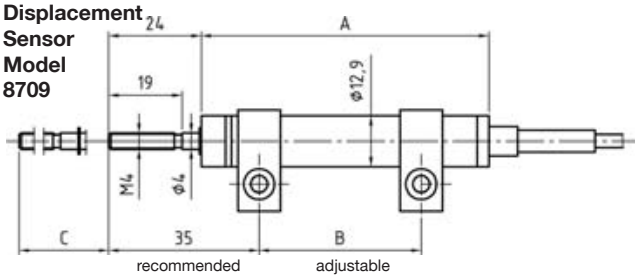
Assembly
Two fastening clamps for mounting purposes are included with the device, see dimensional drawing. The recommended spacings are given in the table.

Ball joint model 8709-Z002

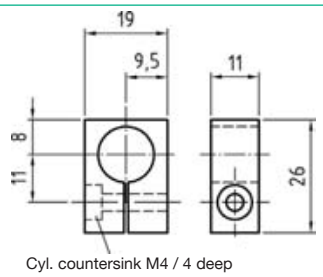


Dimensional drawings

Displacement Sensor Model 8709



Holder Model 8709-Z001



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 **Model 8709-5100**
Range 100 mm

Accessories

Mounting set **Model 8709-Z001**
(2 holders for mounting, refer to drawing)
1 set is part of delivery

Ball joint (refer to drawing, in the lower left) **Model 8709-Z002**
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 **Order Code: 99004**
only for connection to SENSORMASTER 9163 desktop version **Order Code: 99002**

Analysis and amplifier units like digital indicator 9180, amplifier 9243 or USB sensor interface 9205 or DIGIFORCE®
refer to section 9 of the catalog

Manufacturer Calibration Certificate (WKS)

Calibration of the sensor with or without evaluation electronics. Calibration with 6 calibration points in 20 % increments.

Potentiometric Displacement Sensors

Models 8710, 8711

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

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

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 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	± 0.05 % 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

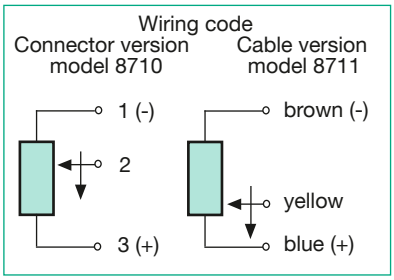
Shock resistance: 50 g, 11 ms

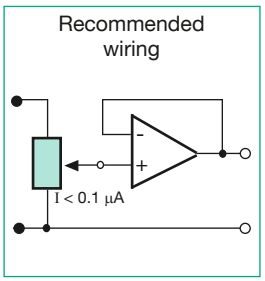
Radial clearance of driving rod: ≤ 0.015 mm

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



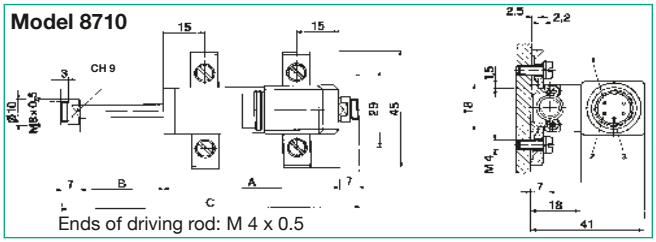


Important:
The excellent characteristics of the sensor are evident, if the slider load in the voltage divider is < 0.1 µA. If the measurement chain requires higher currents, an operational amplifier should be used, connected as a voltage follower (I < 0.1 µA) (see diagram above).

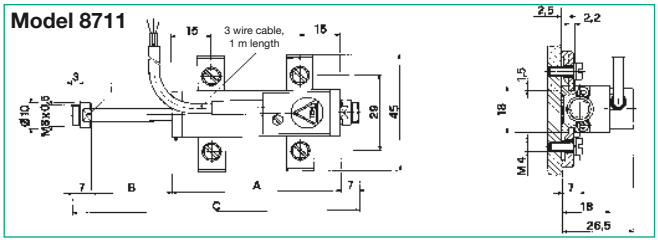
Mounting: with two 2 axial moveable clips, refer to diagram (in scope of delivery)

Dimensional drawings

Model 8710



Model 8711



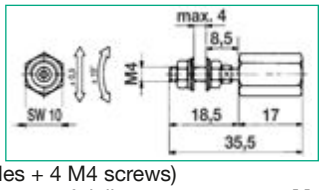
The CAD drawing (3D/2D) for this sensor can be imported online directly into your CAD system.
Download via www.burster.com or directly at www.traceparts.com. For further information about the burster traceparts cooperation refer to data sheet 80-CAD-EN.

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 9205 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).

Potentiometric Displacement Sensors

Models 8712, 8713

Code:	8712 EN
Delivery:	ex stock
Warranty:	24 months

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

Model 8712

Model 8713

8712 EN

- **Measurement ranges: 0 ... 10 mm to 0 ... 150 mm**
- **Non-linearity up to 0.05 % F.S.**
- **Durability 10^8 operations**
- **Resolution 0.01 mm**
- **Follower roll on request**

Application

These displacement sensors are potentiometric displacement sensors used for direct measurement, testing and monitoring of mechanical displacements. The spring-loaded control rod eliminates the need of coupling with the measurement object.

A prerequisite for a very long life duration of the devices is a parallel alignment of the motion direction of the measurement object and the rod.

Areas of application are:

Displacement on

- ► Electromagnets
- ► Hydraulic cylinders
- ► Switches and buttons

Measurements of

- ► Deformation
- ► Bending
- ► Press-fits
- ► Feed strokes

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 a long-term stability.

The rods are guided in long-life, low friction sliding bearings with close tolerances which provide high durability and measuring quality. The pre-stressed spring presses the sensor tip against the measurement object. This spring is double-guided and disappears in the probe head, if the rod is in its end position.
The probe tip consists of a ball made of stainless steel. The bore at rod end serves for coupling retraction units.
The rod is protected against twist for measurement ranges up to 50 mm. The probe tip (hexagonal) must not be turned by any tool, otherwise its anti-twist protection will be destroyed.

Technical Data

*length of housing **total mechanical deflection

Order Code	Measuring Range (+1/ -0)	Dimensions [mm] A*	B**	C	D	Non-Linearity	Total Mass	Moveable Mass	Dissipation at 40 °C
8712 - 10	10 mm	48	15	32	108	± 0.3 % F.S.	60 g	18 g	0.2 W
8712 - 25	25 mm	63	30	32	138	± 0.2 % F.S.	75 g	23 g	0.6 W
8712 - 50	50 mm	88	55	40	196	± 0.1 % F.S.	95 g	33 g	1.2 W
8712 - 100	100 mm	138	115	40	298	± 0.1 % F.S.	140 g	50 g	2.2 W
8712 - 125	125 mm	163	148	40	364	± 0.05 % F.S.	190 g	58 g	2.2 W
8712 - 150	150 mm	188	186	40	427	± 0.05 % F.S.	245 g	66 g	2.2 W
8713 - 10	10 mm	48	15	32	108	± 0.3 % F.S.	60 g	18 g	0.2 W
8713 - 25	25 mm	63	30	32	138	± 0.2 % F.S.	75 g	23 g	0.6 W
8713 - 50	50 mm	88	55	40	196	± 0.1 % F.S.	95 g	33 g	1.2 W

Electrical values

Resistance:
- measuring range 10 mm and 25 mm: 1 kΩ
- measuring range 50 mm and 100 mm: 5 kΩ

Tolerance of resistance: ± 20 %

Max. operating voltage:
- measuring range 10 mm: 14 V
- measuring range 25 mm: 25 V
- measuring range 50 mm up to 150 mm: 50 V

Recommended current in slider circuit: < 0.1 µA

Max. current in slider circuit: 10 mA
(> 0.1 µA negative influence to linearity and durability)

Insulation resistance: > 100 MΩ at 500 V

Electrical strength: 500 V_{eff} at 50 Hz

Environmental conditions

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

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

Temperature coefficient:
- of connection resistance: max. - 200 ± 200 ppm/K
- of output voltage: < 1.5 ppm/K

Mechanical values

Non-linearity: refer to table

Resolution: 0.01 mm

Durability: > 10^8

Displacement force, horizontal: ≤ 4 N

Displacement speed: max. 10 m/s

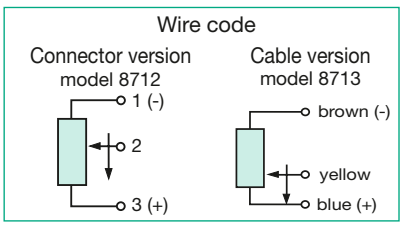
Endurance limit: 5 ... 2000 Hz, A_{max} = 0.75 mm, a_{max} = 20 g

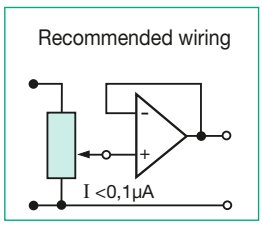
Shock resistance: 50 g, 11 ms

Protection class: acc. to EN 60529 IP40

Material: housing aluminium, anodized; rod stainless steel AISI 303

Electrical connection:
- model 8712: Plug-in connector 5 pin, (Mating connector model 9991 is in scope of delivery, refer to accessories)
- model 8713: integrated connecting cable, length 1 m, ø 4 mm





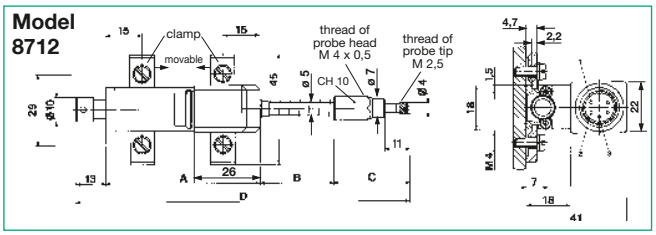
Important:

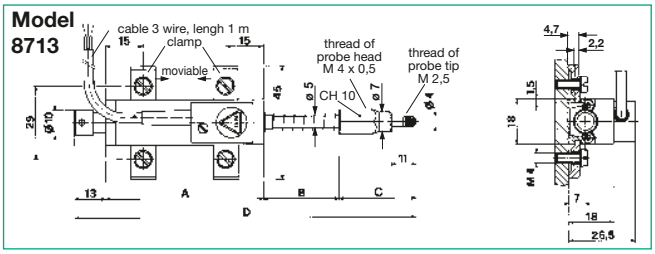
The excellent characteristics of these sensors are only evident when the slider current is < 0.1 µA. If the measuring chain requires higher currents, it is recommended to use an operational amplifier connected as a voltage follower (I < 0.1 µA), (refer to drawing above).

Mounting:

with 2 axial movable clips, refer to drawing (included in scope of delivery)

Dimensional drawings





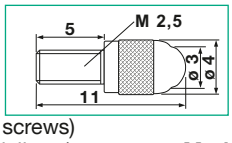
The CAD drawing (3D/2D) for this sensor can be imported online directly into your CAD system.
Download via www.burster.com or directly at www.traceparts.com. For further information about the burster traceparts cooperation refer to data sheet 80-CAD-EN.

Order Information

Potentiometrical displacement sensor, range 50 mm **Model 8712-50**

Accessories

Probe Tip (Ball ø = 3) **Model 8707**
(1 unit is included in scope of delivery)



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

for Model 8712:

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

Mating connector, 5 pin, 90° outlet **Model 9900-V590**

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

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

Connecting cable to 9310, length 3 m **Model 99209-591A-0090030**

Connecting cable to 9162 panel housing, length 3 m **Model 99564-591B-0160030**

for Model 8713:

Connector, 12 pin, for burster desktop devices **Model 9941**

Cable connector, 5 pin **Model 99121**

Mounting of a coupling connector to cable **Order Code: 99004**

Only for connection to SENSORMASTER 9163, desktop version **Order Code: 99002**

Evaluation units, amplifiers and process control units, like digital indicator model 9180, modular amplifier model 9243 or DIGIFORCE® 9306 **refer to section 9 of the catalog**

Manufacturers Calibration Certificate (WKS)

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

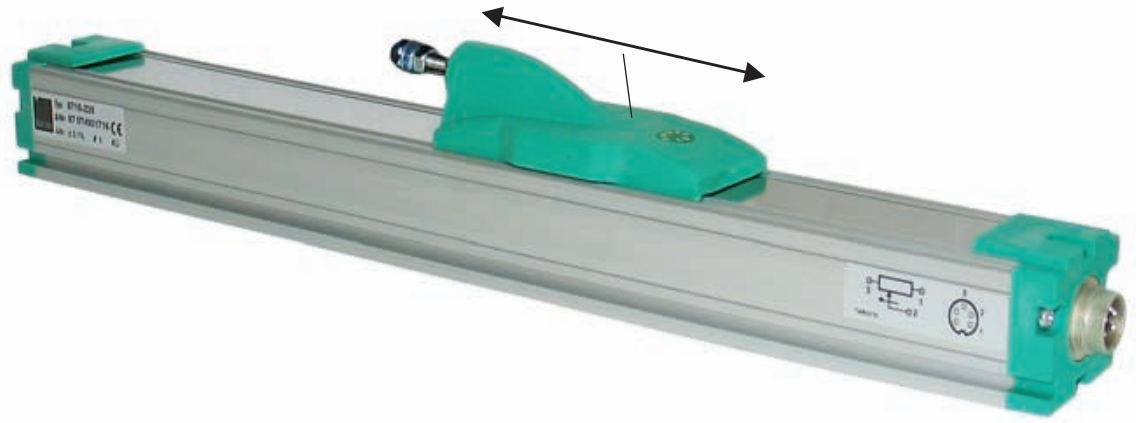
Potentiometric Displacement Sensor

Without rod

Model 8718

Code:	8718 EN
Delivery:	ex stock
Warranty:	24 months

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



- **Measurement ranges from 0 ... 100 mm to 0 ... 2000 mm**
- **Non-linearity up to 0.05 % F.S.**
- **Compact design, without rod**
- **Displacement speed up to 10 m/s**
- **Durability >10^8 operations**

8718 EN

Application

The high resolution allows linear measurements to be accurately sized even in large measurement ranges. Conversion of rotatory and translational motion by spindles, wires or others is not necessary for direct displacement measurement.

Areas of application are:

- ► Hydraulic and pneumatic cylinders
- ► Detection of positions on coordinate inspection machines
- ► Displacement of plungers, knee levers or extruders
- ► Coil and de coil lengths
- ► Strokes on chassis
- ► Metering strokes

Description

Displacement sensors model 8718, using a resistance track made of conductive plastic material, are suitable for direct, accurate and absolute measurements of displacements and lengths.

Special processes are applied to give the resistance tracks low friction, low tendency to stick/slip, resistance to abrasion and long-term stability.

The vibration-cushioned slider allows a clear signal output even by slight shocks or high operating speeds up to 10 m/s. Due to its simple design the sensor is largely protected against electrical interference fields (Al-housing), it keeps the measured value after a power failure and does not generate any electrical interference.

A magnetically hold steel band covers the whole measurement device gap free. Any lateral forces are avoided by a ball joint coupling mounted to the sensor.

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Technical Data

Meas. Range [mm]	100	150	200	300	400	500	600	750	1000	1250	1500	1750	2000
Max. Electr. +3/-0 Usable Length [mm]	103	153	204	305	406	509	611	763	1017	1271	1521	1771	2021
Max. Deflection A [mm]	113	163	214	315	416	519	621	773	1027	1281	1531	1781	2031
Non-Linearity [F.S.]	±0.1%	±0.1%	±0.1%	±0.1%	±0.1%	±0.05%	±0.05%	±0.05%	±0.05%	±0.05%	±0.05%	±0.05%	±0.05%
Resistance [kΩ]	5	5	5	5	10	10	10	10	10	20	20	20	20
Length of Housing B [mm]	253	303	354	455	556	659	761	913	1167	1421	1671	1921	2171
Total Weight [kg]	0.5	0.58	0.65	0.80	0.95	1.1	1.25	1.5	1.85	2.25	2.6	3.0	3.8
Order Code 8718-	100	150	200	300	400	500	600	750	1000	1250	1500	1750	2000

Electrical values

Tolerance of resistance:		± 20 %
Operating current in slider circuit:	recomm. max.	< 0.1 µA 10 mA
Max. power rating at 40 °C (0 W at 120 °C):		3 W
Max. operating voltage:		50 V
Insulation resistance:		> 100 MΩ at 500 V, 2s
Voltage resistance:		< 100 µA at 500 V~, 50 Hz, 2s

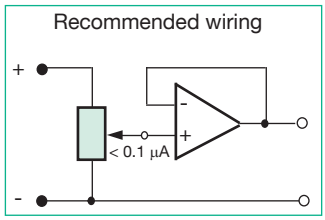
Environmental conditions

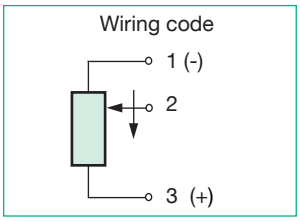
Operation temperature range:	- 30 °C ... + 100 °C
Storage temperature range:	- 50 °C ... + 120 °C
Temperature coefficient of resistance:	- 200 ... ± 200 ppm/K
Temperature coefficient of output voltage:	< 1.5 ppm/K

Mechanical values

Resolution:		0.01 mm
Durability:		10^8
Displacement force (horizontal):		≤ 1.2 N
Displacement speed:		standard 10 m/s
Vibration:	5 ... 2000 Hz, A_{max} = 0.75 mm, a_{max} = 20g	
Acceleration in operation:		max. 200 m/s² (20g)
Shock resistance:		50 g, 11 ms
Weight of the slider:		67 g
Protection class:	acc. EN 60529	IP40
Material:	slider housing	stainless steel AISI303 anodized aluminium

Electrical connection:
Plug-in connector 5 pin model 9991 in scope of deliver
(Mating connector refer to accessories)





Important

The technical data stated are only evident, if the sensor is used properly. The sensor only shows its excellent characteristics when the slider current in the voltage divider is < 0.1 µA. If the measurement chain requires higher currents, it is advisable to connect an operational amplifier as a voltage follower (I < 0,1 µA) (refer to drawing above). Usage near the slider blocks (slider at the end of the conductor track) may cause a higher measurement error.

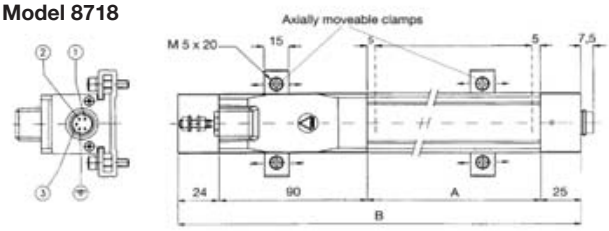
Mounting:
By clamps with adjustable distance or with guard rail on the bottom side for alternative mounting.

Mounting Advice

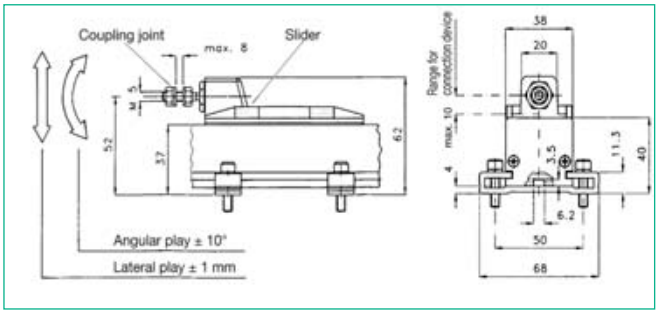
The clamps allow a fine adjustment of the sensor's mounting position. It may be an advantage to mount the sensors with the ball joint coupling in the lower position. This will bring the drainage areas on both sides of the slider into work and the masking band is better protected against pollution, also in rough environments.

Dimensional drawing

Model 8718



Slider with coupling joint



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
standard version, measurement range 500 mm **Model 8718-500**

Accessories

Mating connector (cable coupling 5 pin)
1 unit is part of delivery **Model 9991**

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

Connection cable suitable to burster desktop devices
with 12 pin plug-in connector, length 3 m **Model 99132**
to model 9162 (installation): **Model 99564-592B-0160030**

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

Mounting clamps (1 set is included in scope of delivery)
for sensors with meas. lengths up to 750 mm* **Model 87018**
for sensors with meas. lengths from 1000 to 2000 mm** **Model 87019**
*(1 set = 2 parts), **(1 set = 3 parts)

Supply units, amplifiers and process control units like indicator model 9163, modular amplifier model 9243 or DIGIFORCE®
refer to section 9 of the catalog.

Manufacturer Calibration Certificate (WKS)

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

Potentiometric Displacement Sensor

Model 8719

Code:	8719 EN
Delivery:	ex stock / 5 weeks
Warranty:	24 months

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

NEW Option Protection Class IP67

- **Measuring ranges: between 0 ... 50 mm and 0 ... 900 mm**
- **Non-linearity ± 0.05% F.S.**
- **Resolution: 0.01 mm**
- **Durability: Up to 100 x 10^6 movements**
- **Adjustment speed up to 10 m/s**
- **Plug or cable connection**
- **Protection classes IP60, IP65 and IP67**

8719 EN

Application

Due to its high resolution also when measuring long distances, linear displacement measurements up to 900 mm can be carried out. Conversions between rotatory and translation movements through ball screws, wire or cord connections and so on are not necessary for direct displacement measurement.

Application fields include

- ► Electromagnets
- ► Deformations - bending
- ► Pneumatic cylinders
- ► Length tolerances
- ► Press-insertions (longitudinal press-fits)
- ► Feed strokes
- ► Machine hubs
- ► Punch, knee lever or extruder distances
- ► Hydraulic cylinders

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 rod is guided in a low-play floating frontal bearing. This absorbs small angular and parallel displacements. The guide lug and slide block have particularly tight tolerances, in order to ensure reliable slider contact.
A ball joint coupling (see accessories) at the end of the sliding shaft minimizes axial errors between the sensor and the equipment.

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Technical Data

Measuring Range [mm]	50	100	130	150	175	200	225	275	300	375	400	450	500	600	750	900
Length of Housing [mm]	112	162	192	212	237	263	288	338	363	439	465	516	571	672	825	977
Total Displacement [mm]	59	109	139	159	184	210	235	285	310	386	412	463	518	619	772	924
Weight of Rod and Slider approx. [g]	50	50	50	50	50	50	100	100	100	200	200	250	250	300	350	400
Total Weight approx. [g]	300	350	400	500	500	500	600	600	650	700	800	900	1000	1200	1400	1600
Order Code 8719-	5050	5100	5130	5150	5175	5200	5225	5275	5300	5375	5400	5450	5500	5600	5750	5900

Electrical values

Resistance:	50-600 mm electr. usable length 750-900 mm electr. usable length	5 kΩ 10 kΩ
Tolerance of resistance:		± 20 %
Operating voltage:		max. 50 V DC
Operating current in slider circuit (see drawing 2):		recom. < 0.1 µA max. 10 mA
Dissipation at 40 °C:		max. 3 W
Insulation resistance:		> 100 MΩ at 500 V DC, 2s
Electric strength:		< 100 µA at 500 V AC, 50 Hz, 2s

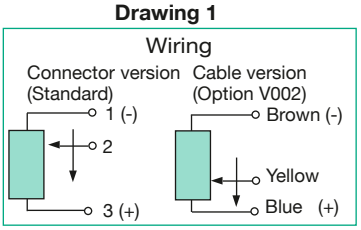
Environmental conditions

Range of operating temperature:		- 30 °C ... 100 °C
Range of storage temperature:		- 50 °C ... 120 °C
Influence of temperature:	to resistance to output voltage	- 200 ± 200 ppm/°C < 1.5 ppm/°C

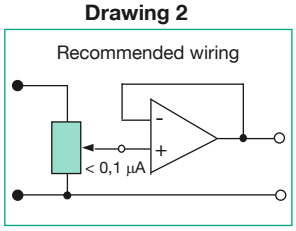
Mechanical values

Non-linearity:		± 0.05 % F.S.
Resolution:		0.01 mm
Durability:		10^8
Displacement force:		≤ 4 N at IP60 and ≤ 25 N at IP65
Displacement speed:		max.10 m/s
Vibrations:		5 ... 2000 Hz, A_{max} = 0,75 mm, a_{max} = 20 g
Acceleration in operation:		max. 200 m/s² (20 g)
Shock resistance:		50 g, 11 ms
Material:	Rod	stainless steel AISI303
	Housing	anodized aluminium
Protection class:	acc. to EN 60529	standard IP60 (IP65 option)
Electrical connection:		refer to drawing 1

Drawing 1



Drawing 2



Important:

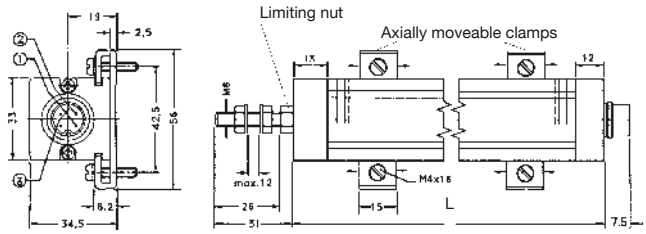
The technical data quoted can only be maintained if the sensors are used properly. Their outstanding properties are only available when the loading of the slider in the voltage divider is kept < 0.1 µA. If the measuring chain draws higher currents, the use of an operational amplifier as a voltage follower (I < 0.1 µA) is necessary (see Drawing 2).
If used close to the stops (slider at the end of the conductor track) the measurement errors can be higher.

Mounting Instructions:

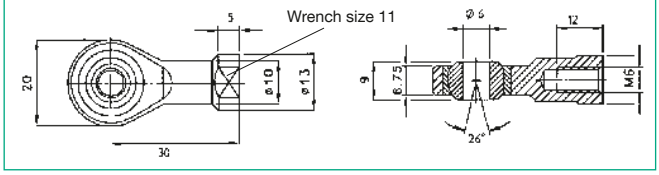
Clamps with adjustable clearance; sensor can be clipped into the fitted clamps.

Dimensional drawings

Model 8719



Model 8705 ball joint (accessory)



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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

1. Potentiometric displacement sensor standard version, range 200 mm **Model 8719-5200**
2. Potentiometric displacement sensor range 375 mm, Option: protection class IP65 **Model 8719-5375-V001**

Accessories

Ball joint, refer to drawing above	**Model 8705**
Mounting set, 2 clamps and 4 screws included in scope of delivery	**Model 8719-Z001**
Mating connector, 5 pin (socket, IP40) included in scope of delivery	**Model 9991**
Mating connector, 5 pin (socket, IP40) 90°-outlet	**Model 9900-V590**
Mating connector (socket, IP67) for sensor with mating connector IP65	**Model 9900-V554**
Cable, length 3 m, one end open	**Model 99130**
Cable for connection to burster desktop devices, length 3 m	**Model 99132**
to DIGIFORCE® 9310, length 3 m	**Model 99209-591A-0090030**
to model 9162 (panel version):	**Model 99564-592B-0160030**

Supply units, amplifiers or indicators like digital indicator 9163, amplifier 9243 or DIGIFORCE® **refer to section 9 of the catalog**

Options

Identification	Meaning
V001	protection class IP65
V002	cable outlet (length of the cable 1 m)
V004	V 001 and V 002
V007	protection class IP67

Manufacturer Calibration Certificate (WKS)

Calibration of the sensor with or without evaluation electronics in 20 % steps (6 calibration points).