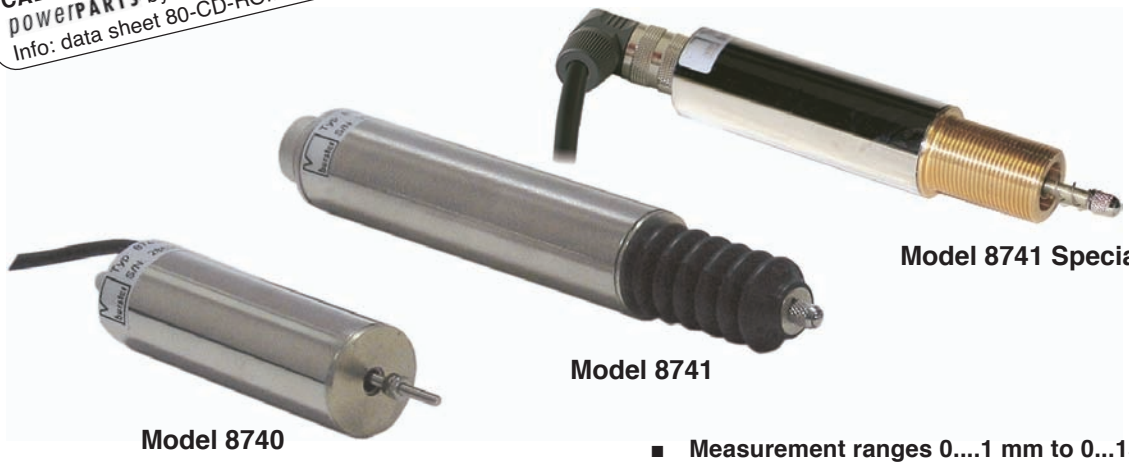
DC/DC Displacement Transducers

Model 8740
Model 8741 (Gauging Type; Spring Loaded)

Code:	8740-E
Manufacturer:	burster
Delivery:	ex stock
Warranty:	24 months

CAD data in 3D/2D available on powerPARTS by web2CAD
Info: data sheet 80-CD-ROM-E



Model 8741 Special version

Model 8741

Model 8740

- **Measurement ranges 0....1 mm to 0...150 mm**
- **Non-linearity ± 0.25 % F.S.**
  or optionally: 0.1 % F.S. or 0.15 % F.S.
- **Integrated instrumentation amplifier, output 0 ... 5 V**
- **Potted electronics, thus not susceptible to vibration or impact**
- **Special versions by request (see options)**

Application

Inductive displacement sensors using the principle of the differential transformer (LVDT) can be used to measure displacement and, indirectly, magnitudes that can be converted into displacements such as force, pressure, strain, torque, vibration and so forth. Thanks to the high quality of their measurements, good protection and long service life, these sensors are used in many branches of technology (industry, research, development ...).

Applications include measuring, controlling, regulating and monitoring both slow and fast movements between machine parts, measurements of position and positional changes of components and structural foundations, servo regulators, valve controllers, robot controllers, growth measurements and so on.

Their design is robust - the internal coils and electronics are potted - as a result of which the sensors can easily withstand shock and vibration. This makes the sensors also suitable for mobile applications (e.g. in vehicles) and for test installations where they will be subject to many test cycles.

Description

These inductive displacement sensors with integrated electronics incorporate a differential transformer and a carrier frequency instrumentation amplifier, potted and protected by a stainless steel housing. The differential transformer consists of one primary winding and two secondary windings; these are arranged symmetrically on either side of the primary winding. The integrated electronics demodulates, filters and amplifies the AC voltage induced in the secondary windings. A rod-shaped core is able to move inside the differential transformer. As an output, the sensor delivers a DC voltage whose magnitude proportionally depends on the position of the movable core inside the sensor.

The model 8740 incorporates a freely movable, non-sprung core with two sliding Teflon rings that center the core in the hole through the body of the sensor. At the end of the moving rod is an M2 thread that can be used to couple the core mechanically to the object being measured. Any lateral force acting on the rod should be avoided.

The movable rod of the model 8741 is mounted on ball bearings. A spring holds the tip of the probe against the object being measured. This version is advantageous when it is difficult or entirely impractical to implement a mechanical coupling. Once again, lateral forces will shorten the service life. The measuring side of the sensor is protected against dirt and water spray by a bellows.

8740-E

Technical Data

Table 1: **Model 8740**

Order code	Measuring range	Dimensions [mm]					Frequency response [Hz]	Sensor weight [g]	Core weight [g]
		L	øD	øC	K	S			
8740 - 5001	0 ... 1 mm	45	20	4	27	34	300	30	2
8740 - 5002	0 ... 2 mm	45	20	4	27	34	300	30	2
8740 - 5005	0 ... 5 mm	61	20	4	45	40	150	60	3.3
8740 - 5010	0 ... 10 mm	61	20	4	45	40	150	60	3.3
8740 - 5025	0 ... 25 mm	91	20	4	56	69	100	90	4.7
8740 - 5050	0 ... 50 mm	151	20	4	97	84	100	130	6.9
8740 - 5100	0 ... 100 mm	271	20	4	136	164	100	250	11.7
8740 - 5150	0 ... 150 mm	441	20	4	288	212	100	400	17.1

Scale Drawing Model 8740

with the optional **fastening thread**
(V302 - see options on page 3)

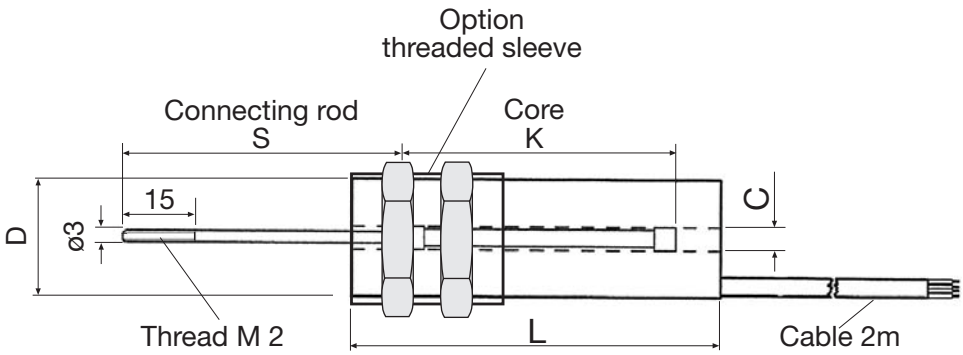
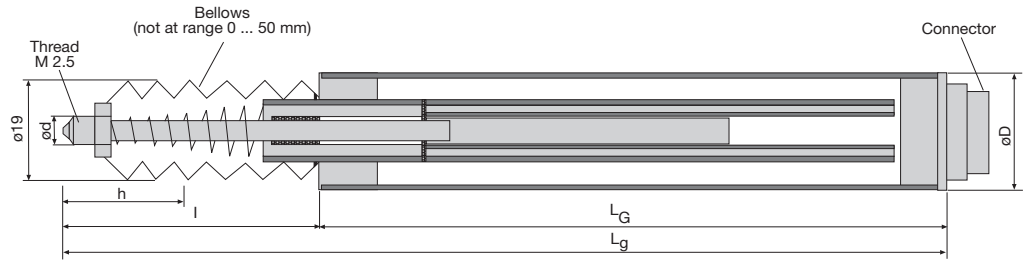


Table 2: **Model 8741**

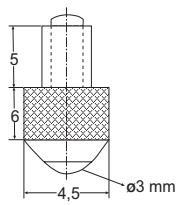
Order code	Measuring range	Dimensions [mm]						Tip force Max [N]	Mechanical frequency [Hz]	Sensor weight [g]
		lg	LG	l	h	øD	ød			
8741 - 5001	0 ... 1 mm	98	66	25	3	20	4.5	2	10	85
8741 - 5002	0 ... 2 mm	98	66	25	4	20	4.5	2	10	85
8741 - 5005	0 ... 5 mm	125	84	34	7	20	4.5	3	10	110
8741 - 5010	0 ... 10 mm	130	84	39	12	20	4.5	3	5	120
8741 - 5025	0 ... 25 mm	190	133	50	27	20	4.5	5	5	150
8741 - 5050 *	0 ... 50 mm	310	210	95	52	20	4.5	8	5	250

* To protect the ball bearing guides, sensors with this measuring range have a sealing lip instead of the bellows.

Scale Drawing Model 8741

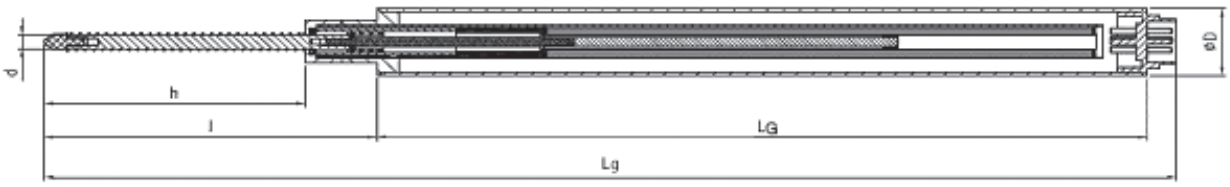


Total displacement h: Ahead 1 mm + range + beyond 1 mm (see tables)



Model 8741-Z001
(thread M 2.5, ball ø 3 mm)

Scale Drawing Model 8741-5050



Sensor CAD drawing can be imported in 3D or 2D version from CD-ROM or downloaded from the Inernet. For more information on powerPARTS by web2CAD please refer to the indroduction of product section 8 in the catalog.

Technical Data

Electrical characteristics

Supply voltage (protected against reserve polarization):	9 ... 28 VDC
Current consumption:	≤ 30 mA
Output voltage (standard):	0 ... 5V
Output voltage ripple:	approx.. 20 mVeff
Internal carrier frequency:	12 kHz
Output impedance:	1 kΩ
Load impedance:	recommended >1 MΩ

Ambient conditions

Operating temperature range:	from -20 °C to 80 °C
Rated temperature range:	from -20 °C to 80 °C
Temperature coefficient *:	0.03 % F.S./K

* with reference to the rated temperature range

Mechanical characteristics

Linearity deviation:	< 0.25% F.S.
Range with unchanged mounting position:	< 0.01% F.S.
Material:	ST 37, nickel-plated
Protection class according to EN 60529	model 8740 IP 64 model 8741 IP 60
General dimensional tolerances:	in according with ISO 2768-f

Electrical connection

Model 8740 — 3-wire, screened PVC cable, ø 3 mm, bending radius ≥ 20 mm, lenght 2 m

Model 8741 — connecting, 7 pin
(model 9952 mating connector is included with delivery)

Pin assignments:

		Model 8740 with 2 m connection cable	Model 8741 pin assignment for 7-pin plug
Supply	(+)	brown	1
Signal	(+)	green	2
Supply / signal	(-)	white	3
		Connect screen to ground)	

Accessories

Holder for model 8740 and 8741 **Model 8740-Z002** (see Fig. 1)

Angle holder for model 8740 an 8741 **Model 8740-Z003** (see Fig. 2)

For **model 8740**:

- **Plug,** 12-pin for burster table-top devices **Model 9941**
- **Plug mounting,** to the sensor cable **Model 99004**

For the **position sensor model 8741**:

- **Mating connector** (coupling socket), 7-pin, ø 18 mm, length 70 mm (included) **Model 9952**
- **Mating connector,** 7-pin, angled (90°) IP 40 length 30 mm **Model 9900-V557**
- **Connecting cable,** 4-wire, length 3 m one end free **Model 99552-000A-0090030**
- **Connecting cable**, 4-wire, for connection to the burster table-top device **Model 99141-552A-0090030**
- **Probe tip,** thread M 2.5, ball ø 3 mm (included with the 8741) **Model 8741-Z001**

Devices and systems for measurement acquisition or process monitoring see section 9 of catalog.

Factory Calibration Certificate (WKS)

Standard factory calibration certificate in 20 % steps, rising, with or without display unit. See the Calibration brochure for more details.

Options

V201: Trailable cable 3 m (other cable lengths by request)
V302: Sensor housing with mounting thread M 24 x 1.5 x 45 including 2 nuts (see drawing). The threaded sleeve is mounted flush at the front of the sensor housing.
V501: Output voltage 0 ... 10 V (other output ranges by request)
V511: Linearity deviation ± 0.15 % F.S.

Order Information

- Inductive displacement sensor 8740, measuring range 10 mm **Model 8740-5010**
- Inductive displacement sensor 8740, measuring range 25 mm, with the mounting thread option M 24 x 1.5 **Model 8740-5025-V302**
- Inductive displacement sensor 8741, measuring range 10 mm, with the linearity deviation option ± 0.15 % F.S. **Model 8741-501-V511**

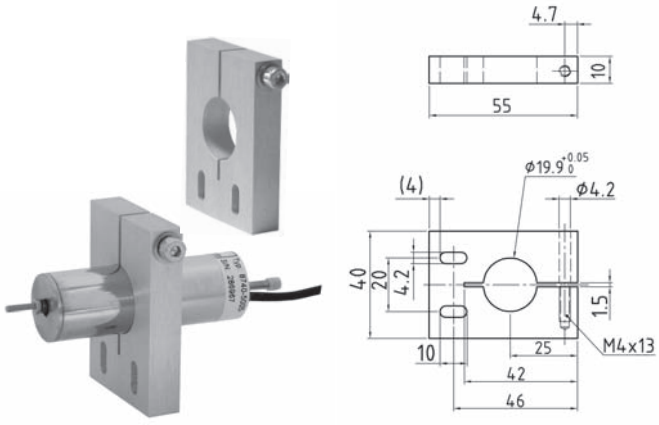
Mounting instructions

Fastening the sensor body using a holder or the mounting thread (see Fig. 1 to Fig. 3).

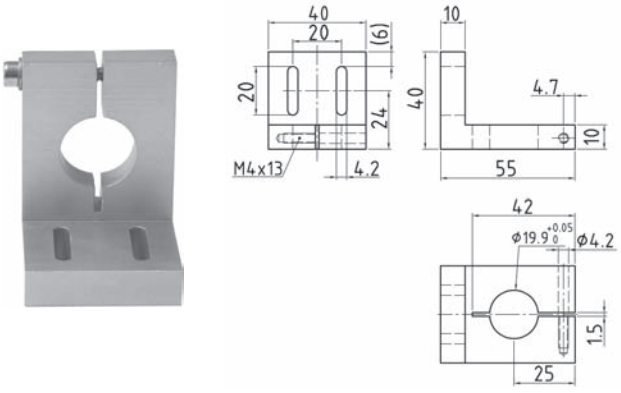
Coupling to the movable rod (8740) with thread M 2 x 1.5 (2 nuts are included).

Fastening options for the 8740 an 8741.

Model 8740-Z002

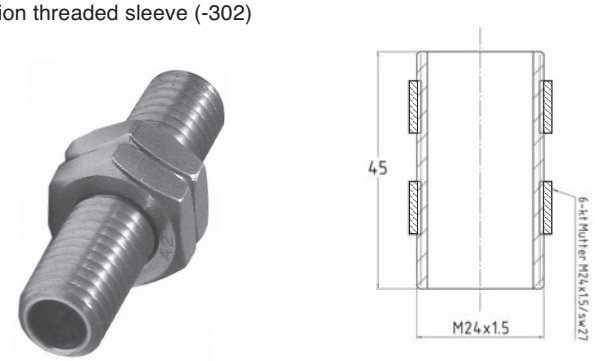


Model 8740-Z003



Model 8740-Z004

Option threaded sleeve (-302)



8740-E

Special versions (by request)

Sensor with **radial cable outlet (Option V601)**
The radial cable outlet allows the space behind the sensor to be used for other purposes.

Sensor with **mounting thread (Option V302)**
The unit can be fastened easily and without strain using the mounting thread an the 2 supplied nuts.

The **90° angled connector (Model 9900-V557)**
Various alignment options and the housing thread permit easy adjustment of the sensor during mounting.

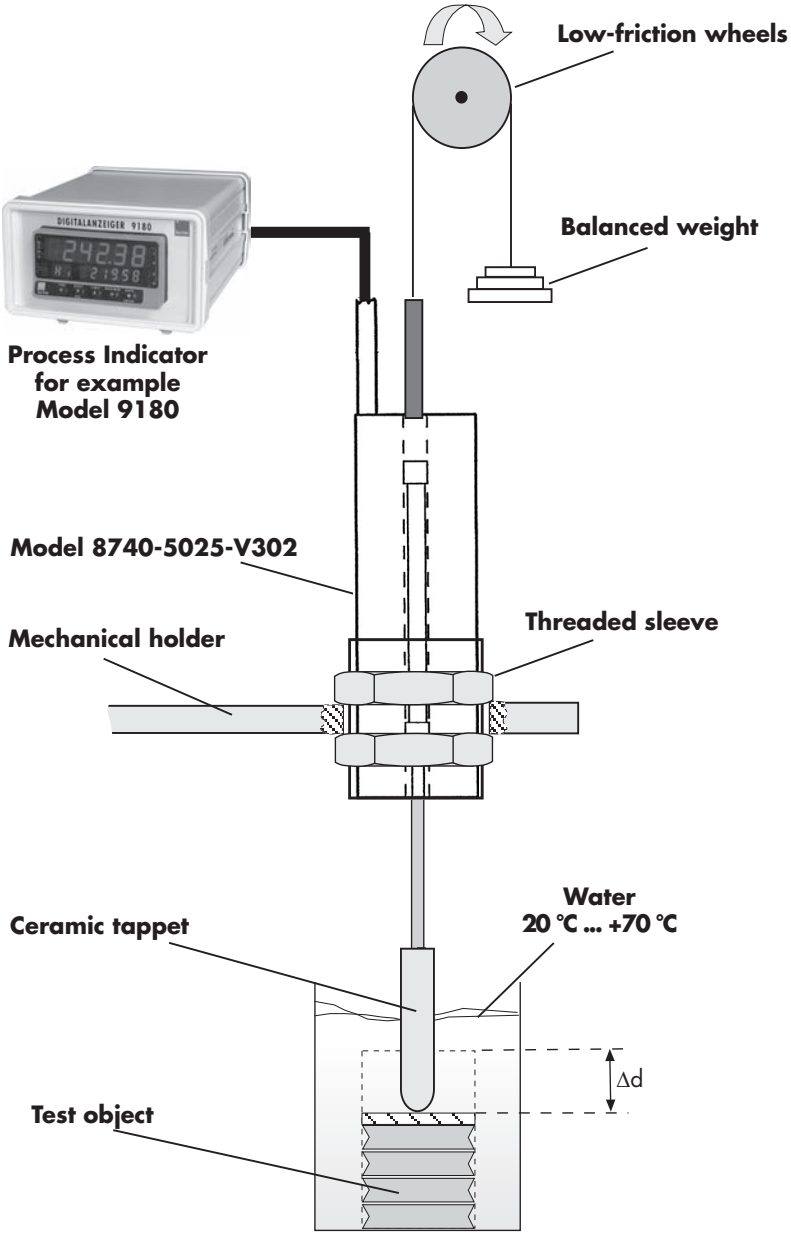
Example application

Task:

A structured, metallic mesh is squeezed to a small diameter in a water bath. The mesh expands again as the water is heated. This extension is to be measured by a very precise inductive displacement sensor, whose rod can move very smoothly within the body of the sensor. The expansion of the sample results in a movement of 15 mm. In spite of the extremely low weight of the sensor bat, it is necessary to ensure that its weight does not affect the measurement.

Solution:

The model 8740, with a measuring range of 25 mm, offers the necessary precision. It can measure the expansion accurately with its extremely light movable rod in conjunction with a well-adjusted counterbalance. The optionally modifiable mounting thread allows it to be easily mounted without straining the body of the sensor. Extending the sensor bar by means of a special ceramic peg ensures that mechanical expansion as a result of temperature changes is almost entirely eliminated.



Application example