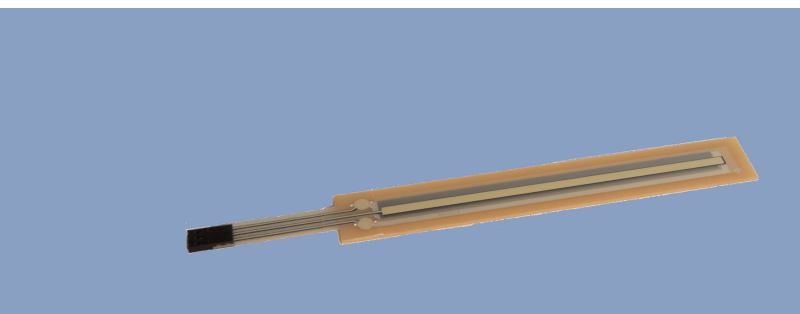


NOVOFOIL Potentiometric Sensors with membrane collector

Series LFP



Special features

- flat profile
- resistant to dirt, dust or liquid
- very robust
- very good linearity up to $<\pm 0.3\%$
- long life
- temperature resistant up to $+105^\circ\text{C}$
- protection class IP 67

Technology

The sensors for linear position measurement consist of an FR4 substrate and a collector foil, which are separated by a spacer.

On the FR4 substrate, the potentiometer track is applied in a screen-printing process. On the opposite sheet, the collector foil, a low-ohmic collector track is printed. A mechanical pressure, usually performed by a simple pin, contacts the potentiometer track with the collector track.

Novotechnik is firmly committed to a technology with FR4 substrates. This technique allows the use of standard methods of the potentiometer technology. With our approved screen printing inks and a subsequent linearization step, high life data and very good linearity values can be achieved over the lifetime.

Benefits

When using the pin operated version, the cover sheet, which absorbs the forces of the actuating pin, is designed in the form of an FR4-Prepreg. Therefore the sensor can be operated up to $+125^\circ\text{C}$ temperatures.

Polyester based solutions, available on the market today, do not withstand these temperatures. They are not linearized and are also very critical in the application, because even small dust particles between the sensor and the adhesive surface lead to failures.

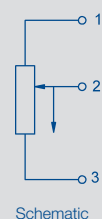
Membrane sensor potentiometers are very flat and can be glued to plane surfaces in the required form.

Apart from linear designs are also rotary systems producible.

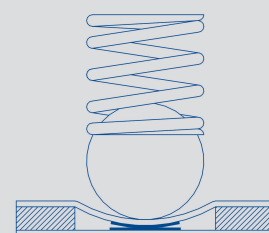
Another advantage is the hermetically sealed structure of the membrane sensor potentiometer. Dirt, dust or humidity can not invade the sensor and therefore the use in a difficult environment is possible. It must be emphasized that the handling is very simple since the sensitive potentiometer track is protected by the cover sheet.

Applications

Similar to the classic wiper potentiometer system there are various applications for this system e.g. adjustment systems in car- and truck seats, window lifter, convertible tops, mirror systems, medical devices, positioning of solar panels, robot systems, valve actuators and much more.



Schematic



Functional principle

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© 03/2012
Art.-No.: 062 785

Subject to changes
Printed in Germany

Typbezeichnung	LFP-0050	LFP-0100	LFP-0150	LFP-0200	LFP-0250	LFP-0300	LFP-0350	LFP-0400	LFP-0450	LFP-0500	
Electrical Data											
Defined electrical range	Standard 50 mm up to 500 mm in 50 mm steps, optional length in 25 mm steps. Customized length are possible.										mm
Electrical range	56.2	106.4	156.6	206.8	257.0	307.2	357.4	407.6	457.8	508.0	±0.2 mm
Total resistance	2	4	6	8	10	12	14	16	18	20	kΩ
	(optionally other resistance values are possible)										
Resistance tolerance	20										±%
Independent linearity	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	±%
	(optionally selected linearities are possible)										
Repeatability	typ. 0.05										mm
Hysteresis	typ. 0.25										mm
Recommended operating wiper current	≤ 1										μA
Max. wiper current in case of malfunction	5										mA
Max. permissible applied voltage	30										V
Temperature coefficient of the output-to-applied voltage ratio	typ. 15										ppm/K
Insulation resistance (500 VDC)	≥ 10										MΩ
Dielectric strength (500 VAC, 50Hz)	≤ 100										μA
Mechanical Data											
Mechanical range	60.2	110.4	160.6	210.8	261.0	311.2	361.4	411.6	461.8	512.0	mm
Length element	89.6	140.4	191.2	242.0	292.8	343.6	394.4	445.2	496.0	546.8	±0.5 mm
Width element	21.3										±0.5 mm
Thickness element	1.7										±0.2 mm
Position marker (accessories)	mechanical wiper as screw marker M6 with spring-loaded ball										
Position marker fitting pressure	2										±1 N
Electrical connection	Standard flex with 40 mm and 3-pin bushing plug. Customized connections are possible.										
Environmental Data											
Temperature range	Standard -25...+105; -40...+125 with limited performance										°C
Operating humidity range	0...95 (no condensation)										% R.H.
Vibration DIN IEC 68T2-6	5...2000 A _{max} = 0.75 a _{max} = 20										Hz mm g
Shock DIN IEC 68T2-27	50 11										g ms
Life	> 25 x 10 ⁶										movements
Adjustment speed	1.0										m/s max.
Protection class DIN EN 60529	up to IP 67 (0.5 h in 1 m water depth), except connector										
Mounting options	optional adhesive foil on the rear side										

Order designations			
Type	Art.-No.	Type	Art.-No.
LFP-0050-001-001-001	043502	LFP-0225-001-001-001	043509
LFP-0075-001-001-001	043503	LFP-0250-001-001-001	043510
LFP-0100-001-001-001	043504	LFP-0275-001-001-001	043511
LFP-0125-001-001-001	043505	LFP-0300-001-001-001	043512
LFP-0150-001-001-001	043506	LFP-0325-001-001-001	043513
LFP-0175-001-001-001	043507	LFP-0350-001-001-001	043514
LFP-0200-001-001-001	043508		

Recommended accessories
Pin Z-LFP-P01,
Art.No. 070301.

Important
All values specified in this data sheet for linearity, lifetime and temperature coefficient are only valid for a sensor used as a voltage divider with virtually no load applied to the wiper ($I_E \leq 1 \mu A$).