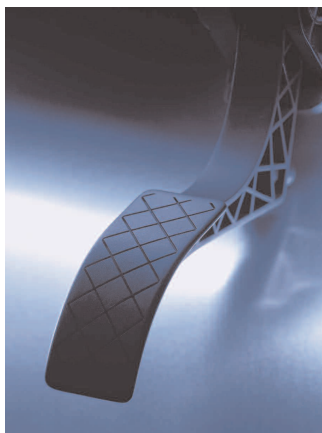


Resistive Elements
for
Linear and Rotary
Measurement



Novotechnik resistive elements ensure safe and trouble-free operation in various applications. They control precision valves, keep satellites on track and fulfill highest demands on precision and durability.

Potentiometric elements for linear and rotary position measurement

In recent years, great progress was made in measurement technologies. Contactless alternatives have in the last years substituted in various applications arrived conductive plastic potentiometers. Experience shows, however, that in many applications still potentiometric sensors are the best choice. They convince by having an unbeaten price-to-value ratio. With the field proven and tested screen printed resistive layers vast life time data is achieved, using linearity trimming excellent linearities persisting a whole life time are possible. Its outstanding reliability potentiometric sensors from Novotechnik have proven in automotive applications such as the throttle valve. More than 50 million sensors are in the field without any field rejects.

Fast travel speeds - low current consumption and harsh environments

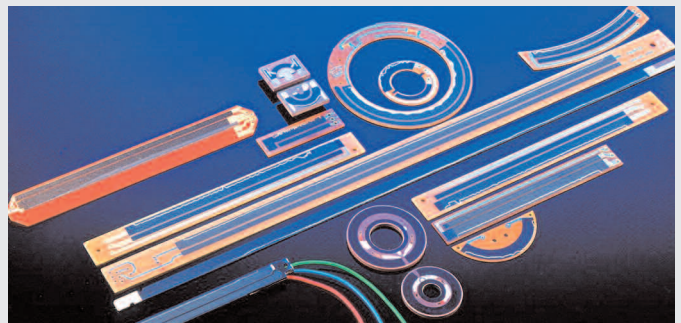
Potentiometric sensors basically consist of two components: a resistive element and a precious metal wiper. Thus they are easily integratable in the respective application where a rotating shaft or a push rod moves the wiper element. This makes the wiper contact move along the element. The resulting electrical potential that is picked up is absolutely proportional to the actual angular or linear movement and has a very high resolution as the signal is an analog one. High travel velocities are not problematic and the output is provided in real time without signal delays. Due to their low current consumption, potentiometric sensors are particularly perfect in mobile and battery powered applications or when powered from a current loop. This can even be easily enhanced when the potentiometer is driven in a pulsed mode.

The potentiometer in general resists shock and vibration up to 50 g and can so be operated in vibrating applications such as often seen in outside applications. The allowed temperature range can reach -55 up to even 150°C without time limitations. Being a passive component, a potentiometer has enormous advantages regarding EMC behaviour and qualification issues in development processes. Another feature is the useability of potentiometers in explosive environments in cooperation with an intrinsically safe supply.

The perfectly tailored solution for any application

The resistive element and the wiper element can be tailored to the subsequent applications requirements full custom specific. In this process, additional switch functions can be integrated making additional switch solutions obsolete. Various fixation alternatives as well as diverse contacting possibilities exist like bonding pads, soldering pins or pre-confectioned cable harnesses stand at choice.

Despite of automotive applications like throttle valve or gas pedal, compact potentiometric elements are perfect for diverse mobile and industrial areas of use like for example Joysticks or regulating valves.



Custom specific versions

Sensors for harsh environments, also in redundant layout, in any geometry and sizes from miniature up to large versions for hollow large shaft use.

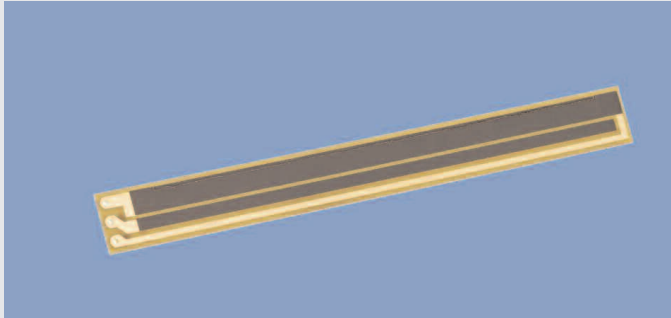
- various designs
- selectable resistance values
- integrated switching functions
- redundant designs for safety-critical applications
- contact via wires / solder pins / plugs / bonding / flexible tongue



Wipers in any shape and geometry

for the contacting of resistive and collector track of a potentiometer.

- contact precious metal
- high contact security and hence transmission quality of the positional information
- low electrical resistance
- in standard and specific versions available



Linear resistive elements, series PTN / PTX / XT

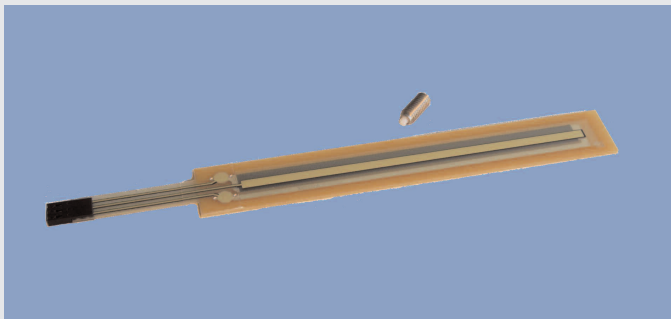
suited for integration in closed devices with small spaces. A typical area for use are actuating drives.

- various mounting by clamping or glueing
- good price to performance ratio
- lengths from 10 up to 300 mm
- custom shapes and lengths

Modular design for linear transducers, series PTP

are a cost optimised solution where the focus is on reliability and accuracy in protected applications.

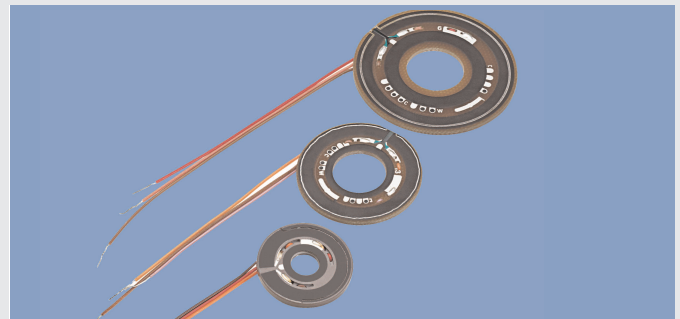
- easy mounting due to modular design and end stops
- alternative between resistance elements and linear transducers
- guided wiper with variable drive options like rod or pin
- soldering pads, cable or individual wire outlet



NOVOFOIL - Potentiometric sensors with membrane collector, series LFP

fluid proof by membrane design. A punctual pressure pin replaces a conventional wiper.

- easy mounting due to adhesive tape and flexible connector
- insensitive against dirt, dust particles or fluids
- robust and easy to handle
- flat shape



Rotary resistive elements, series PRS / XP

in open design. These elements are ideally suited for space saving integration in protected areas.

- proven and tested elaborate contacting of individual wires
- sensor for use in hollow and end of shaft applications
- alternative contacting options
- uninterrupted 360° measurement possible with 2nd wiper system



Modular design for rotary resistor elements

stackable design for rotary elements with integrated solder contacts

- tolerances provide stacks without loss of linearity
- easy design, even multiple redundant systems
- flat design: only 5.4 mm each system
- Fixation by clamping the top of stack system



Wherever positions and angles need measuring with the utmost precision, sensors from Novotechnik are the first-choice solution. The expertise in measuring technology that we have amassed in the course of more than 60 years is just one of the secrets behind a success story that began back in 1947:

The other cornerstones of our success include a passion for technology and an obsession with precision and reliability. Then there is our delight in devising solutions, coupled with a fascination with new materials and production methods. And of course there is our constant awareness of the importance of providing sound advice and top-class service, as we strive day-by-day to optimise our measuring systems.

But the secret of our success has always been our passionate pursuit of the best possible solution for each individual customer applications. And to ensure that we remain

the first-choice partner for our customers, in future we will be staying focused on the strengths that made us the successful company that we are today.

Leading OEMs from a whole spectrum of industries put their trust in position transducers and rotary sensors made by Novotechnik: be it general engineering, hydraulics, pneumatics, measuring technology or automotive engineering. And talking of the automobile industry, every day more than 45 000 of our sensor components are built into new cars.

Representatives worldwide

Today, Novotechnik is represented in all of the world's major markets - be it with our own offices or by approved dealers. Thanks to his tightly-knit network we can ensure that, wherever they happen to be, our customers can rely on first-class service and customer care.

Your contacts can be found
[www.novotechnik.de / service](http://www.novotechnik.de/service).