

## Linear Transducers



### Linear Sensors at a Glance

Sensor solutions are as different as the automation tasks. Novotechnik offers innovative Linear Sensors for every requirement.

## The Variety of Position Sensors

Linear transducers have to meet many requirements in industrial and mobile automation. Required properties are robustness, speed, accuracy and - especially with regard to Industry 4.0 - communication capability. At the same time, the choice of the appropriate measuring principle and the right sensor is always determined by the specific measuring task.

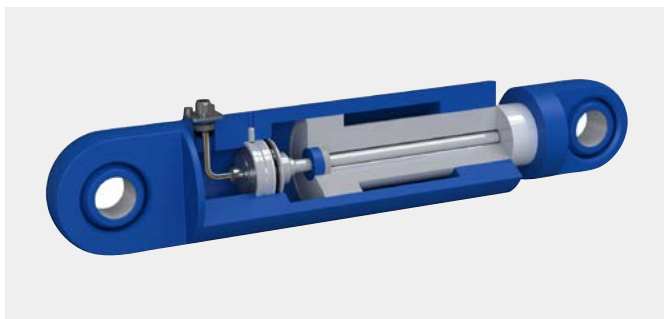
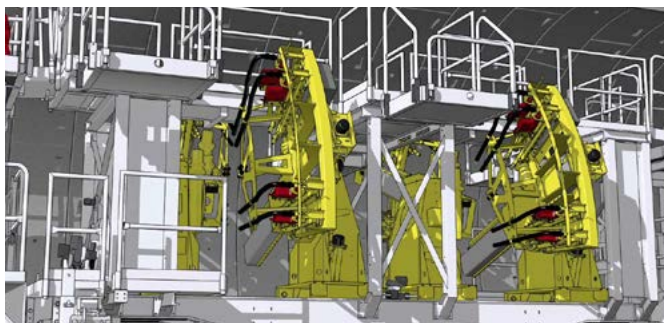
Our product range offers touchless, magnetostrictive linear sensors as well as highly dynamic inductive transducers, compact magnetic sensors and high-quality potentiometric linear transducers displacement transducers.



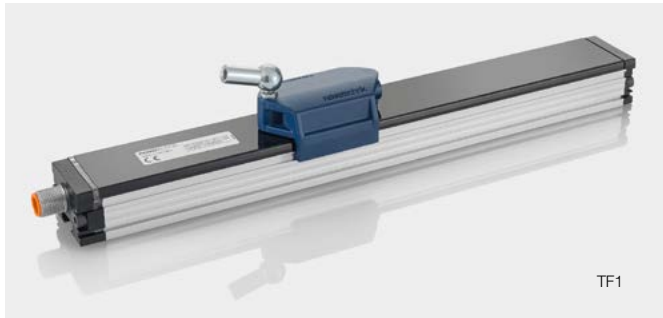
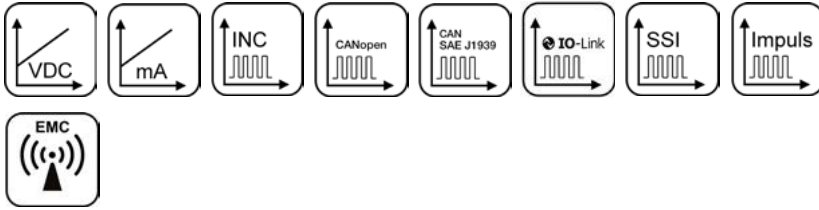
Foto: Arburg

## The Perfect Match for any Application

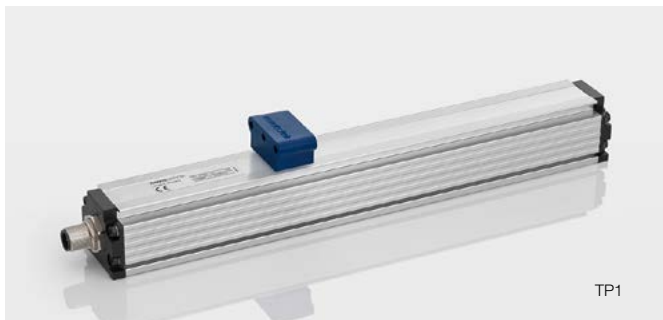
There is virtually no limit to the possible uses for Novotechnik sensors. The applications span a wide spectrum: They range from the use in injection molding and die-casting machines, in hydraulic and pneumatic cylinders, in presses and punches in sheet metal processing, in packaging or woodworking machines or for position detection in production lines. Standard, modified standard, or completely new sensors designed according to your specifications – we have a solution. Talk to us.



# Touchless and Non-contacting Linear Transducer Profil- and Rod-Style



TF1



TP1



TM1



TH1

Für weitere Informationen klicken  
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## Highly Dynamic: Non-contacting Linear Transducer in Profile Design

The inductive linear position sensor **TF1** is predestined for highly dynamic positioning tasks. It is available in standard lengths of 100 to 1,000 mm. The measuring system's update rate is  $\geq 10\text{kHz}$ , resulting in a time lag of only 0.2 milliseconds between the actual position and the corresponding measurement value. This dynamic allows for shorter cycle times in production lines, since the target positions can be reached at higher speeds. The sensor is operating at a resolution of up to 1 micrometer.

Some typical applications are linear drives; injection molding and die casting equipment; presses and punches for sheet metal processing; packaging or wood processing equipment; and in general position sensing in rapid motion units of production lines. Of interest to metal-processing companies in particular is the fact that metal dust or flakes will not collect on the non-magnetic position marker. The measured signal is provided as an analog current/voltage signal or digitally, via SSI. Additionally, CANopen standard or IO-Link communication interfaces are available.

The **TP1** series is available for measuring ranges between 50 and 4,500 mm with either a free, i.e. contactless, or a guided position marker. They meet the requirements of the protection type IP67 or IP68 as standard. Depending on the interface, up to three positions as well as speed can be measured.

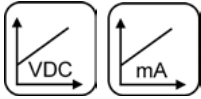
Both linear transducer series are very robust and highly accurate over their entire service life, even in critical applications. The service life is thanks to the contactless measuring principle mechanically practically unlimited.

## New Position Sensing Technology for Mobile Hydraulics and Machine Engineering

The linear position sensor **TM1** series have been developed to fit directly into the pressure areas of hydraulic or pneumatic cylinders. They reliably acquire the positions and speeds of mobile machinery – at a resolution of 0.1 mm, and even under adverse environmental conditions. The linear sensors are suitable for measuring positions of up to 2,000 mm and are optimized for applications with the highest EMV requirements. They conform to EN 13309 for construction machinery as well as to ISO 14982 for agricultural and forestry machinery, and they feature protection against RF fields of up to 200V/m according to ISO 11452-2, thereby by far surpassing the E1 requirements of the German federal motor vehicle office, the Kraftfahrt-bundesamt (KBA).

Ideal for measuring ranges up to 4,250 mm is our linear sensor **TH1** series. During development, special emphasis was placed on the security of the internal measured value processing and on the data output with a repeatability rate of 16 kHz. The temperature coefficient of the transducers is very small due to the measuring method, design and selected materials.

## Potentiometric and Inductive Sensors: Robust and compact



T / TS



TE1



TEX



TX2



LS1

For further information click on the photo

### Compact transducer with proven conductive-plastic technology

These compact linear transducers (18x18 mm) are characterized by double-sided supported actuating rod and a ball coupling.

The ball coupling enables a backlash- and lateral force-free operation even with parallel and angular misalignment of transducer and measuring direction.

Due to the small design and robustness, the sensors are ideal for industrial applications in measurement, control and regulation technology such as small presses and textile machines as well as measurements of deformations and feed paths in testing technology.

The potentiometric series **T** and **TS** are available for measuring ranges from 25 up to 150 mm.

They are characterized by their high repeatability, a long service life of up to 100 million movements and excellent linearity values.

The **TE1** series has an integrated signal processing for standardized current or voltage output signals and is suitable for measuring ranges from 25 up to 150 mm.

The **TEX** and **TX2** series are available with push rod or pivot head mounting and are suitable for measuring ranges up to 300 mm.

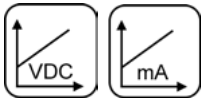
Mounting with low-backlash rod ends allows a large freedom of angles. The **TX2** is also optionally available with sliding metal mounting blocks.

### Non-contacting with Teach-In Function

With our inductive linear sensors of the **LS1** series, we have developed a wear-free alternative to practically all commercially available small linear potentiometers with a square cross-section. The dimensions of the sensors are fully compatible with the previously mentioned potentiometric series.

Because of a teach-in function and status LED, this version is suitable for many applications in control, regulation and measurement technology.

Measuring ranges are from 25 to 200 mm available.



TR/TRS

### Compact transducer with return spring and hardened metal probe tip

These robust versions also have a double-sided bearing push rod, which can absorb transverse forces that can occur when scanning curves or wedge disks.

Due to the precisely mounted push rod, very high repeatability and high travel speeds are achieved. A hardened metal tip and the internal return spring ensure a very long service life of up to 100 million movements.

The potentiometric transducers of the **TR** and **TRS** series have proven themselves excellently in many applications. The measuring ranges are from 10 up to 100 mm and are optionally available with cable or plug connection.

The sensors of the **TE1** series are also compact and robust. They are manufactured with proven conductive plastic technology and have an integrated signal conditioning that can be connected directly to the analog inputs of the controllers. The measuring ranges are from 25 up to 100 mm.

The potentiometric **TEX** series have an external return spring and enable direct measurement without form fitting position determination. The measuring ranges are between 10 and 200 mm.

### Inductive, wear-free and with Teach-In Function

The **LS1** series is a contactless alternative to the potentiometric variants. With a teach-in function and status LED, this version is suitable for many applications in control, regulation and measurement technology.

Measuring ranges are from 25 up to 200 mm.



TE1



TEX



LS1

For further information click on the photo



## Potentiometric Linear Transducers: Proven Technology



LWG



LWX with shaft protection



LWH



TLH

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Potentiometric linear transducers have proven themselves for many decades in different areas of application due to their favorable price/performance ratio as well as their reliability and robustness.

Due to the simplicity of the measuring system - passive and absolute - the transducers are mostly insensitive to electrical and magnetic interference.

In case of a power failure, they do not lose the measured value and do not generate their own interference voltage.

### Transducer with Push Rod:

The transducers of the **LWG** and **LWX** series are characterized by their robust design and simple assembly using rod ends.

Because of the fact that the wiper is decoupled from the push rod high accuracy and a long service life can be ensured.

Both series are suitable for measuring ranges from 50 up to 750 mm and are optionally available as cable or plug versions.

Designed for extreme operating environments, the **LWX** series features an all-metal construction and a pressure compensation system with GORE-membran to prevent buildup that could degrade operation in mechanical, vehicle, automation and robotic applications where an extended operating life is essential.

An additional shaft protection is available.

The universally applicable transducer with push rod, series **LWH**, can be used for measuring ranges from 75 to to 900 mm.

A pivoting front bearing over comes „stick-slip“ type of

operation even where some angular or out of parallel errors are present. The technique for fixing and making connections to the resistance track ensures the highest degree of reliability even under harsh working conditions.

By mounting overhead on difficult-to-reach spaces it is possible to premount the clamps to the mounting surface and then simply “snap-on” the transducer. The transducer has mounting grooves on all four housing surfaces. Thus the transducer can always be mounted with the resistance element directed upwards independent of the mounting surface.

### Transducer with Slider:

The **TLH** series with sliding carriage is suitable for measuring ranges from 100 up to 3,000 mm.

The rodless design utilizes a magnetically-restrained stainless steel band to cover the opening through which the actuator operates. Thus, the actuator is driven from the side, along the unit length. Fastening by means of tension clamps that can be moved longitudinally allows the installation position to be finely adjusted.



## Quality

Our commitment to quality is demonstrated by the fact that we were one of the first companies in the world to have our operations certified to ISO/TS 16949. At Novotechnik our process begins with stringent and demanding specifications and ends with the inspection of every single product. This helps ensure that every product we manufacture performs exactly as designed.

Each batch of sensor components within the production and supply chain can be traced using the type identification on the sensor.

The expertise that we have gathered over more than 75 years is the foundation of our success, especially in safety-related applications.



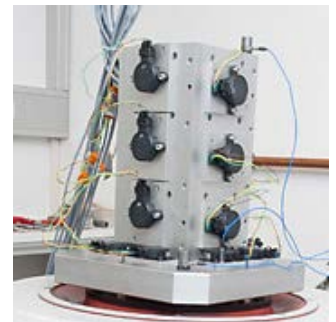
## A well-equipped test facility ensures high quality

To guarantee that all products meet the quality standards and requirements of our customers, all components must pass strict testing procedures.

Our products are subjected to a wide range of environmental tests during product development. They have to work perfectly. Novotechnik has a well-equipped test facility with various testing machines to meet this commitment.

We can provide:

- EMC measurements
- Climate stress tests for temperature, humidity and temperature shock
- Mechanical stress, vibration, shock, and life tests.



All approval tests are carried out in accordance with current applicable standards. Non-standard tests are defined based on our extensive experience in sensor development using our own testing procedures.

As part of the company's certification to IATF 16949, our environment simulation laboratory is committed to strict compliance with all relevant standards.

For special tests that cannot be done in house we use only certified external laboratories.



Fascination with technology. Demand for precision and reliability. Solution-oriented thinking. Curiosity with new materials and production methods. A keen sense of service. These traits support our mission to continuously improve our measuring systems.

The greatest secret of our success, however, is our passion for devising the best possible solution for each individual customer and application. To this end, we will continue to focus on the strengths that made us the successful company we are today.

Logistics, construction, agriculture, medical, test and measurement, automotive... Leading equipment manufacturers from a multitude of industries place their trust in position transducers and rotary sensors from Novotechnik.

In the automobile industry alone, more than 25,000 of our sensor components are installed into new cars each and every day. Over 100 million throttle sensors from Novotechnik have been installed in safety-relevant X-by-wire applications without field failures.

## Representatives worldwide

Today, Novotechnik is represented in all of the world's major markets, by our own subsidiaries or approved dealers. Wherever our customers are, they can rely on first-class service and customer care thanks to this tightly-knit network.

Your contacts can be found <https://www.novotechnik.de/nc/en/service/representatives/Seite>