Solutions for Position and Distance Measurement – Products

Inductive sensors

- Position and distance measurement of metal objects
- Insensitive to harsh environmental conditions and contamination

Ultrasonic sensors

- Suitable for the distance measurement of solid materials, granules, liquids and powders
- Independent of material type and color
- Resistant to environmental conditions such as dirt, dust and water

Photoelectric sensors

- Measurement and monitoring of distances to different types of objects – both transparent as well as very dark objects
- Independent of material, properties and consistency of the object

Radar sensors

- Detection of moving or static objects,
  e.g. cranes, trains, trucks and freight
- Can be used in virtually all environmental and climatic conditions

Linear position sensors

- Position detection and measurement
- Magnetostrictive linear position sensors are particularly suited for
  position measurement
  in hydraulic cylinders
- Insensitive to shock, vibration and other mechanical stresses

Encoders

- Monitoring of rotary movement, positions, angles and lengths
- Wear-free and able to withstand the toughest environmental conditions

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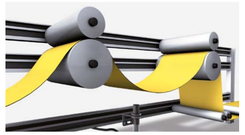
Solutions for Position and Distance Measurement – Applications

Height control in dough machines

- The Li linear position sensor ensures permanent quality control through the continuous measurement of the dough thickness
- Contactless operation, resulting in permanently high degree of protection and accuracy
- Absolutely wear-free



Sag control

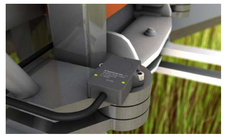
- In order to ensure constant and steady conveying movement, the RU-M18 ultrasonic sensor controls the sag of foils, paper and other wound materials during winding and unwinding
- Regardless of any surface properties, such as the color of the material and dust caused by friction

Measurement of ground clearance on field sprayers

- The T30U ultrasonic sensor measures the distance between the sprayer boom and the field or crop to ensure that the boom has optimum clearance.
- Robust and compact design for durable use, e.g. in mobile equipment
- The measuring range can be adjusted simply via the Teach button or Teach cable

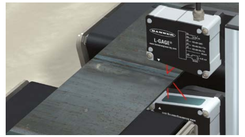
Speed monitoring of conveyor belts

- The contactless QR24 inductive encoder reliably detects the speed of a transport system for potatoes
- As a fully encapsulated device, it can withstand aggressive chemicals and high pressures in the cleaning process
- It is insensitive to motor shaft vibrations thanks to the contactless inductive operation principle



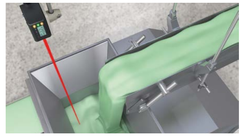
Angle measurement on field sprayers

- The QR20 contactless encoder permanently measures the projection angle of the spray arms on opening to ensure dynamic and error-free movement
- The extremely compact housing and non-magnetic operating principle enable it to be mounted in confined steel structures
- High EMC performance guarantees continuous error-free operation



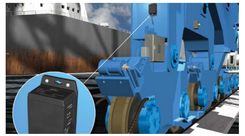
Sheet metal thickness measurement

- The photoelectric sensors of the LH series protect expensive punching tools from damage by measuring the thickness of the sheet metal
- High-precision thickness measurement in the micrometer range, even with dark and discolored materials



Level control in large hoppers

- The LTF photoelectric sensor makes sure that sufficient chewing gum mass is available for further processing in the hopper by measuring with millimeter precision the level of the moved mass
- Irrespective of the reflective surfaces in the hopper



Collision prevention on cranes

- The Q120 radar sensor prevents crane collisions by means of a warning or stop signal when an object is dangerously close
- Detects moving or static objects
- Suitable for use in harsh environments as it is unaffected by wind, rain, mist, humidity and air temperature

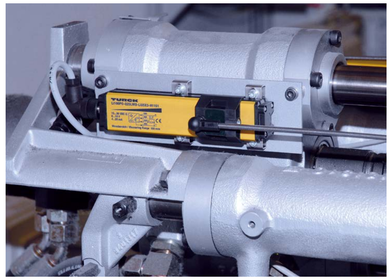
Your Global Automation Partner

Solutions for Position and Distance Measurement

Solutions for Position and Distance Measurement – Precise and Wear-Free

Position and distance measurement, and its derived measured values of angle, velocity and rotational speed, are some of the most important metrics in industry. Different sensor technologies can be used for measuring positions, distances and angles. The technology most suitable for the measuring task at hand depends on the length of the measuring range, as well as the type of material and surface properties of the object concerned.

Turck offers a comprehensive portfolio for position and distance measurement, including inductive and photoelectric sensors as well as ultrasonic, radar and linear position sensors. The portfolio also includes encoders for measuring angle positions and rotary movements. The different sensor technologies are suitable for ranges from a few millimeters up to one hundred meters. Turck sensors stand out on account of their precision, wear-free and robust design, as well as environmental compatibility.



Your benefits

The use of Turck sensors for position and distance measurement gives you as a user a number of benefits:

- More efficient production processes
- Improved quality control
- Reduced failure rates
- Reduced production costs

Typical applications

Sensors for position and distance measurement are used in a wide range of application fields:

- Distance measurement
- Position determination
- Object measurement
- Diameter measurement
- Sag and deformation control
- Material flow monitoring
- Level measurement

Small ranges

Positions and distances in manufacturing processes are often very small since the space available is often very confined and restricted. Inductive and ultrasonic sensors continuously measure small distances to objects.

Instead of the simple and precise detection of metal objects, inductive distance sensors make it possible to measure the distance or a change in position. These sensors measure distances of up to 50 mm away from a metal object, with wear-free operation and unaffected by harsh environmental conditions and dirt.

Ultrasonic sensors are suitable for the distance measurement of solid materials, granules, liquids and powders. They offer contactless measurement of heights, fill levels or sag, irrespective of the type and color of the material. Transparent objects that are difficult to detect using photoelectric sensors are also reliably and safely detected with ultrasonic sensors. Sensors of the "Standard" series are able to detect ranges of 2.5 to 40 cm. Sensors of the "High End" series are suitable for sensing ranges up to 6 m.

Medium ranges

Inductive linear position sensors are suitable for linear distance and position measurement, such as for machine parts or processing units. They operate wear-free and have short blind zones. The compact variants of the Li-Q17L inductive linear position sensors are used for measuring ranges from 50 to 300 mm. Large measuring ranges up to 2000 mm are measured by the Li-Q25L inductive linear position sensors.

The magnetostrictive sensors in a rod design were specially designed for precise position measurement in hydraulic cylinders. Combined with optionally available float magnets fill level detection can also be implemented. They are extremely robust and reliable since they are insensitive to shock, vibration and contamination. With this kind of distance measurement, distances of 100 to 7600 mm can be measured.

Photoelectric sensors that operate with the triangulation principle are suitable for medium ranges. They measure the distance to the target objects from 25 to 1000 mm, regardless of the material, properties and consistency of the object. The photoelectric sensors also offer precise and reliable measuring results even with acute detection angles or very bright ambient light. They are particularly suitable for the distance measurement of small or very fast moving objects.

Large ranges

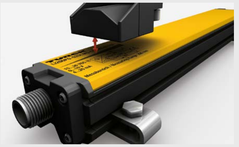
Large ranges up to over 10 meters can be measured with photoelectric and radar sensors. Photoelectric sensors that use time of flight laser technology, offer a high range of up to 24 m with an extraordinary accuracy. They are suitable for distance measurements and positioning tasks in production halls, high-bay warehouses, cranes or mobile equipment.

Radar sensors detect moving and static objects such as cranes, trains, trucks and cars up to a distance of 100 m. They can be used in virtually all climatic conditions, making them particularly suitable for outdoor applications. Radar sensors are ideal for the collision prevention of fork lifts or harbor machinery.

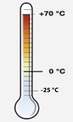
Encoders monitor speeds, rotary movements, positions, angles and indirect lengths with contactless and wear-free operation. In order to ensure work safety, the rotation and tilt angles of buckets or booms are continuously monitored in mobile equipment, such as in excavators or cranes.

Precision
The sensors measure precise distances for a wide range of different materials, even when large distances are involved. High quality individual components ensure precise measurement signals and provide the basis for a high degree of linearity and repeatability.

Robust and leak-proof design
The fully encapsulated module electronics and compliance with protection type IP67 make the sensors extremely robust, fully potted and able to withstand the harshest ambient conditions. They also stand out on account of their excellent resistance to many chemicals and oils.



Wear-free design
The Li linear position sensors have fully contactless and wear-free operation. Important characteristics such as accuracy, linearity and interference immunity are therefore permanent and guarantee perfect sensor operation at any time.



Environmental compatibility
Environmental factors, such as extreme, fluctuating temperatures, shock or contamination by oil, shavings or dust do not impair measurement. The sensors reliably withstand temperatures from -25 to 70 °C, making them suitable for use in any climatic zone.