Solutions for Object Detection – Products

Solutions for Object Detection – Applications

Your Global Automation Partner

TURCK

Products

Inductive sensors

- Detection of metal objects
- Insensitive to harsh environmental conditions and contamination

Capacitive sensors

- Detection of solid materials made from wood, plastic or metal, but also granules or liquids
- Detection is also possible through non-metallic materials as well as through container walls

Photoelectric sensors

- Detection of a wide range of different objects – both transparent as well as very dark objects
- Irrespective of the material, property and consistency of the object

Ultrasonic sensors

- Detection of solid, liquid, granular and powder materials
- Independent of material type and color
- Resistant to environmental conditions such as dirt, dust and water

Magnetic field sensors

- Detection of magnetic objects
- Reliable detection also through non-magnetic materials (e.g. wood, plastic, non-ferrous metal, aluminum, stainless steel)
- Used especially for detecting the piston position in pneumatic cylinders

Over 30 subsidiaries and 60 representatives worldwide!

Applications

Cap control on filling machines

- The uprox®+ inductive proximity switch prevents supply defects through the safe detection of crown caps and screw caps on drink bottles
- Large range for the detection of non-ferrous metals
- Particularly short response time for the operation in drink filling machines
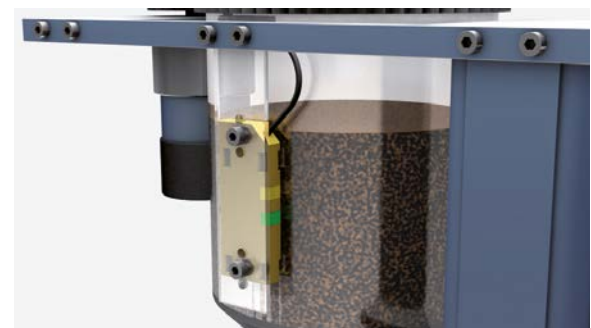
Level monitoring of ground coffee

- The QF5.5 capacitive sensor reliably detects the level of ground coffee inside the container
- Simple integration in machine design thanks to flat sensor shape

Detection of black parts on black door panel

- The Q4X photoelectric sensor provides improved quality control by checking whether foam and other components are correctly fitted to the car door panels
- Robust stainless steel housing withstands mechanical stresses
- Simple, user-friendly sensor equipment

Detection of PET bottles

- The QS18 photoelectric sensor detects plastic PET bottles to regulate product flow on the conveying line of filling plants, irrespective of shape, size and contours
- Several mounting options for straightforward installation

Glass panel detection

- The RU-M18 ultrasonic sensor reliably detects the presence of a glass panel in the final assembly even from a large distance, irrespective of shape, color or transparency
- Robust mechanical design thanks to metal housing or metal connector

Detection and counting of small parts

- The DF-G2 fiber amplifier sensor uses a matrix of PFCVA fiber amplifiers to detect nuts, bolts, screws or other small parts in packaging processes, count them and generate, for example, an output signal after every 10th screw in order to ensure that all packets contain the right quantity
- Ideal for applications involving a rapid response, large distances or high light intensity
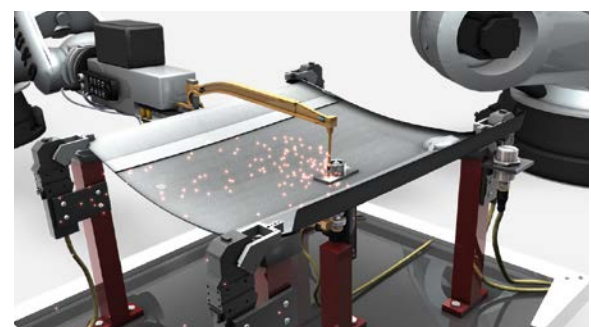
Detection of weld nuts

- The weld nut sensor detects the presence of the weld nut and makes sure it is seated correctly – preventing any expensive rework due to missing weld nuts
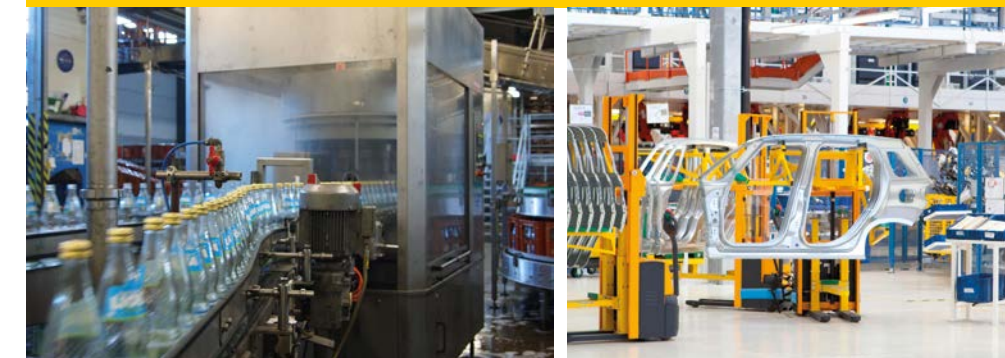- The sensor is protected by a stainless steel centering sleeve

Rotary actuator monitoring

- The DSU35 inductive dual sensor detects the flap position of rotary actuators for position feedback
- Very simple mounting and adjustment
- Plastic housing with IP67 protection resistant to cleaning agent

Solutions for Object Detection

Solutions for Object Detection – Simple and Exact

Whether this is solid material made from wood or paper, metals and non-metals, liquids, granules or permanent magnets – Turck sensors detect objects made from different types of material, in different colors contactless and with highest accuracy. Which sensor technology is most suitable for which measuring task depends on the material type of the object as well as the length of the measuring range.

Turck offers you a comprehensive portfolio for object detection, including inductive, capacitive, photoelectric, magnetic field or ultrasonic sensors. Inductive or capacitive sensors are ideal solutions here, depending on the required range and insensitivity to external conditions. Photoelectric or ultrasonic sensors are best suited for larger ranges.

Turck sensors offer highest accuracy, robust design, tightness, temperature resistance and magnetic field immunity.

Your benefits

The use of Turck sensors for object detection gives you as a user a number of benefits:
- Optimized production processes
- Early detection of faults
- Reduced downtimes
- Improved quality assurance
- Reduced production costs

Typical applications

Sensors for object detection are used in a wide range of application fields:
- Parts detection and counting
- Presence control
- Stack height monitoring
- Clear object detection
- Small parts detection
- Level detection
- Position detection in cylinders
- Position feedback

Detecting metallic objects

Inductive sensors are used for the contactless detection of metal objects up to a distance of 100 mm. Factor 1 sensors, such as the Turck uprox® sensors, have the same high switching distance regardless of whether the object is made from steel, aluminum, brass or copper. The sensors are insensitive to harsh environmental conditions and contamination.

Dual sensors are specially designed for the position monitoring of valves or clamps and reliably detect the end position of actuators. Dual sensors combine the functional reliability of contactless inductive sensors with the flexibility of a surface mounted device. They can be mounted directly on the rotary actuator or clamping device.

Detecting non-metallic objects

Non-metallic objects can be detected with capacitive, photoelectric or ultrasonic sensors.

Capacitive sensors are suitable for the contactless detection both of sold materials made from wood, plastic, metal or compounds, as well as granules or liquids. Detection is also possible through non-metallic materials as well as through container walls. Capacitive sensors detect an object at distances of up to 20 mm. The sensors are used for a wide range of applications: Fill levels of liquids or bulk materials can be detected with the sensors.

Ultrasonic sensors detect objects at larger distances from 20 mm up to 6 m, irrespective of material type and color. It is not important whether the target is transparent or opaque, metallic or non-metallic, firm, liquid or powdery. Ultrasonic sensors can be used in particularly harsh environments. Environmental conditions such as spray, dust or rain also hardly affect the functioning of the sensors.

Different types of objects at distances of up to 24 meters are detected by photoelectric sensors. The material, the properties or consistency of objects are unimportant here. Even transparent or black objects are detected reliably. Depending on the requirements, photoelectric sensors are installed as opposed mode sensors, retroreflective sensors, diffuse mode photoelectric light sensors or fiber amplifiers.

	Metals	Non-metals	Magnets	Clear objects	Small objects
Sensor type					
I	I	–	I	–	–
M	–	–	M	–	–
C	C	C	C	–	–
U	U	U	U	U	–
P	P	P	P	P	P

I = Inductive | M = Magnetic | C = Capacitive | U = Ultrasonic | P = Photoelectric

Detecting magnetic objects

Magnetic objects can be detected easily with magnetic field sensors. They are used either for the contactless detection of the piston position in pneumatic cylinders, by which they detect the magnetic field of the piston through the cylinder wall, or as a proximity sensor with a range of up to 90 mm, e.g. for the position detection of pipe cleaning pigs. The sensors are wear-free, short-circuit proof and robust.

The Turck product portfolio also offers weld nut sensors that are used particularly in the automobile industry. Weld nut sensors detect ferromagnetic components such as spacer sleeves, nuts or washers, fix them at the same time and thus prevent any expensive rework due to missing components.

Detecting transparent objects

Transparent objects such as foils, glass, PET or plastic bottles, as well as transparent packaging, are reliably detected with photoelectric and ultrasonic sensors. They supply reliable detection results irrespective of the surface sheen and structure of the material.

Detecting small objects

Fiber amplifiers are the ideal solution when the mounting space is restricted or small objects have to be detected. Turck sensors detect small parts such as screws or tablets, irrespective of the material. Fiber amplifier sensors, in combination with different types of fiber amplifier, are ideal for different detection tasks.


Highest accuracy
High-quality individual components ensure precise measurement signals and provide the basis for a high degree of linearity and repeatability. Even demanding applications can be implemented economically and effectively with the Turck sensors.

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.
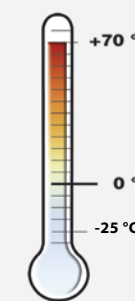
Temperature resistance
The sensors can reliably withstand temperatures in the range from -25 to +70 °C, making them suitable for use in any climatic zone. Even with a change in air temperature, the sensors reliably supply data.

+70 °C
0 °C
-25 °C
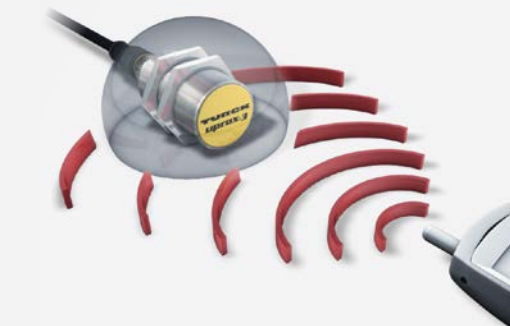
Outstanding EMC performance and magnetic field immunity
The technology of the sensors makes them immune to electromagnetic interference and offer excellent EMC performance. Even damage mechanisms such as water ingress, dust or vibration are not a problem.