

Ultrasonic Sensors

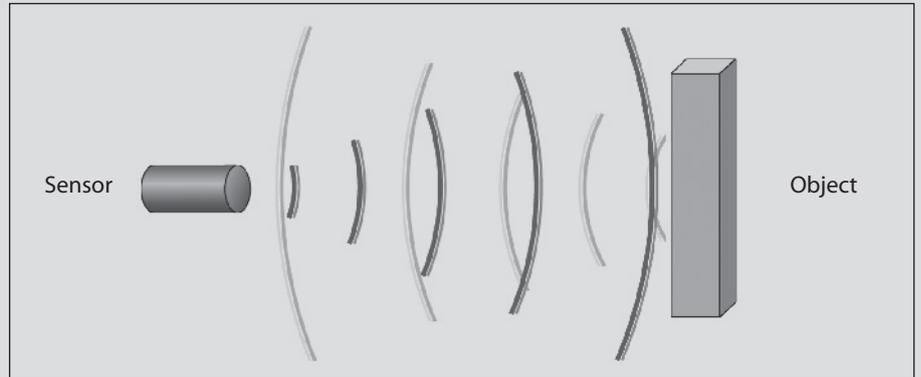
Ultrasonic sensors are used to precisely detect the position of objects of any material and colour, irrespective of external light levels even in harsh industrial environments. The sensors are characterised by high sound intensity that makes it possible to detect even the smallest of objects.

In addition to their high precision, outstanding repeatability and high degree of linearity their strengths also include their suitability for use in universal applications, irrespective of light conditions, as well as colour and material of the objects and substances to be detected.

Ultrasonic sensors produce accurate results even in connection with highly transparent objects such as film or glass surfaces and are completely unaffected by normal levels of soiling on the sensor surface. High performance under the most difficult operating conditions, even in suspended particle or water vapour environments, is a characteristic feature as is their ruggedness under harsh operating conditions.

Thanks to their outstanding properties ultrasonic sensors are used in a diverse range of applications and sectors of industry.

Measuring principle



The sensor emits a sound pulse that is reflected from the object to be detected. The sensor reads in the reflected pulse and the distance to the object is determined by means of a runtime measurement routine.

Advantages

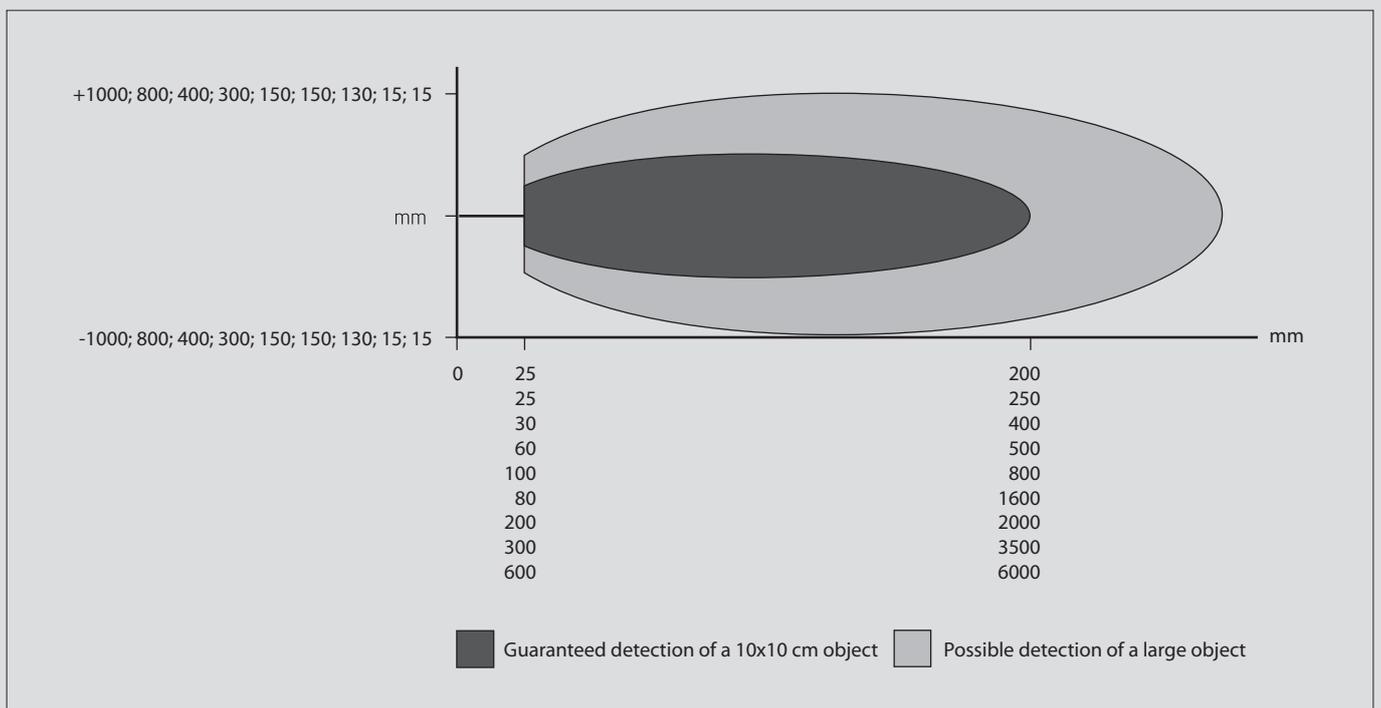
- ⌘ Protection class IP 67
- ⌘ Large detection range of up to 6000 mm (depending on type)
- ⌘ High linearity
- ⌘ High repeat accuracy
- ⌘ Narrow sound beam of 8°
- ⌘ Adaptive 0–10 V voltage or 4–20 mA current output (analogue sensors)
- ⌘ Two adaptive switching outputs, can be used individually or combined in connection with switching sensors (depending on type)

Technical data*

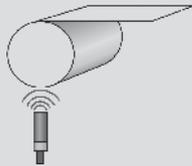
- ⌘ One analogue 0...10 V/4...20 mA output or two switching outputs.
- ⌘ Rated operating voltage range 12 V – 30 V DC
- ⌘ Enclosure: PBT/ GF30
- ⌘ Ambient temperature –15 °C...70 °C
- ⌘ Repeat accuracy ±0.2 % ±2 mm
- ⌘ Hysteresis 1 %

* Please refer to the following catalogue pages and the corresponding datasheets for technical information on the individual products

Detection range:



Application examples:



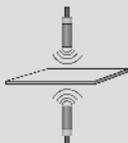
Wind-on and wind-off control
Detection of the diameter of coils in the paper, plastics and textile as well as metal working industries.



Sag control
Detection of sag loop for controlling material tension or controlling quantity of material for the downstream production process.



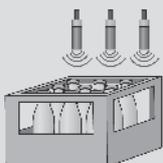
Level measurement
Level measurement of liquids of bulk materials in containers and silos.



Thickness measurement
Thickness measurement of objects.



Completeness check
For checking completeness of objects in containers.

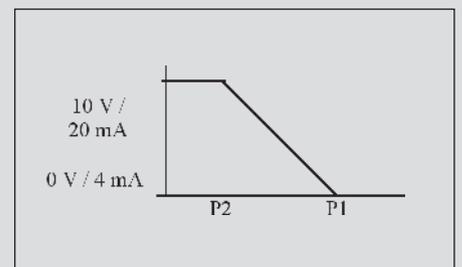
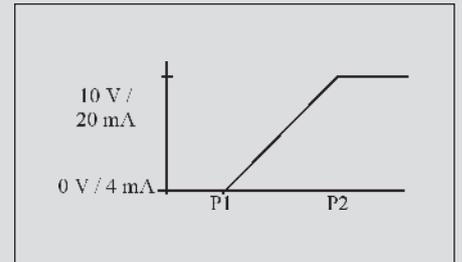


Completeness check of bottles in crates
For checking the presence and height of bottles in crates.

Teach-in procedure

Analogue sensors

Any interval within the measuring range can be selected for the analogue output by means of TeleTeach. The slope of the characteristic curve – positive or negative – can, of course, be set to any value.



The points P1 and P2 determine the position of the analogue characteristic curve: P1 defines the point at which the characteristic curve assumes the value 0 V/4 mA, P2 defines the 10 V/20 mA point. In the case of a “positive characteristic curve”, the sensor is programmed in such a way that the sensor-P1 distance is smaller than the sensor-P2 distance. Correspondingly, sensor-P2 distance is smaller than sensor-P1 distance for a “negative characteristic curve”.

Switching sensors

The two switching outputs are taught-in accurate to the millimetre via a teach-in input. Independent of each other, they can be optionally adapted with 1 % hysteresis as complementary windows (NO / NC) or as complementary switching outputs (NO / NC) with hysteresis adjustable to any value. P1 and P2 define the position of the switching points. The switching point has NO characteristic if the corresponding LED is on while teaching in the switching point and conversely, it has NC characteristic when the LED is off. Two LEDs indicate the switching status of the sensor.

Standards and approvals:

EN 60947-5-2