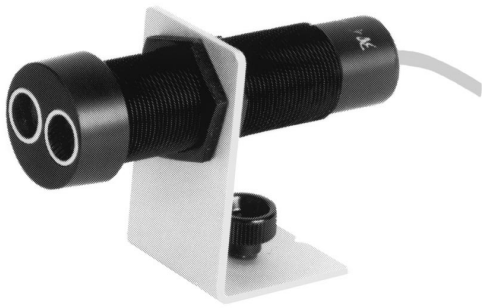
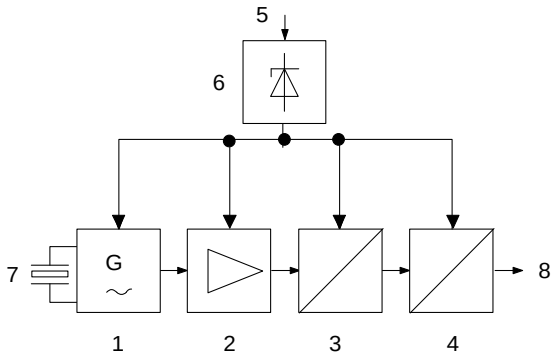




1 Oscillator
2 Amplifier
3 Evaluating unit
4 Measuring transducer
5 External voltage
6 Internal constant voltage supply
7 Ultrasonic converter with active zone
8 Output: Current signal

Design

The ultrasonic sensor can be assembled on a mounting bracket using two connector nuts. The sensor is of cylindrical design with a M30x1 thread.

Function

The operational principle of an ultrasonic sensor is based on the generation of acoustic waves and their detection following reflection on an object. Normally, atmospheric air acts as a carrier of the ultrasonic waves.

A sound generator is actuated for a short period of time and emits an ultrasonic pulse which is inaudible to the human ear. Following emission, the ultrasonic pulse is reflected on an object located within range and echoed back to the receiver. The duration of the ultrasonic pulse is evaluated electronically. Within a certain range, the output signal is proportional to the signal duration of the ultrasonic pulse.

The object to be detected can be made of different materials. The shape or colour, solid, fluid or powdery condition do not have any or a very minimal effect on detection. In the case of objects of smooth, even surface, the surface must be aligned vertically to the ultrasonic beam.

Note

During operation, please observe the polarity of the connected voltage. The terminals are colour coded.

Operating voltage	Positive terminal	white
	Negative terminal	brown
Analogue output signal	Current	green

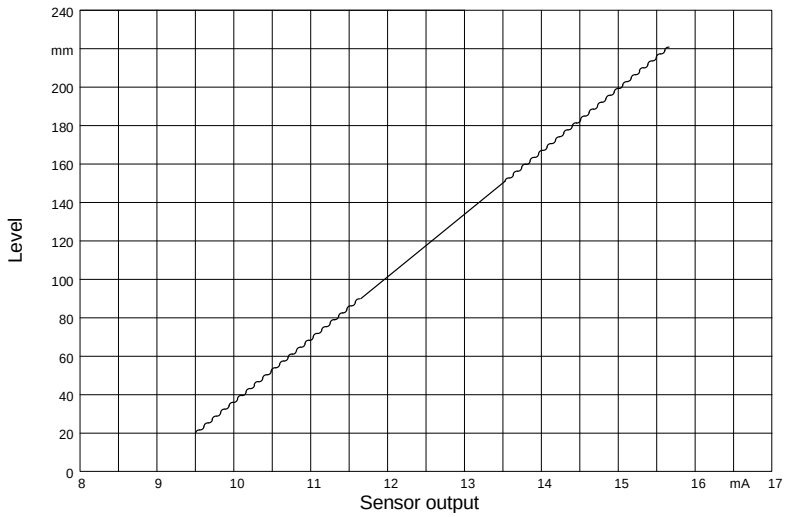
The sensor is protected against reverse polarity.

The sensor output supplies an impressed current and is loaded during short-circuit operation. Ideally, the output should be loaded with a resistance of R_L= 0 Ω.

Technical data

Permissible operating voltage	24 V DC
Current consumption (without load)	< 35 mA
Load resistance	< 400 Ohm
Current output	4 to 20 mA
Measuring range	500 to 150 mm
Minimum distance between sensor and a laterally reflecting wall	> 75 mm
Resolution	± 1 mm
Operating/ambient temperature range	–20 to +75 °C
Temperature drift	0.1%/°C
Linearity error	0.2% FSD* (*FSD = full scale deflection)
Measuring pulse frequency	40 Hz
Sound cone aperture angle	Approx. 5°
Reverse polarity protection	Yes
Degree of protection	IP 65
Materials (housing)	Plastic
Weight	0.250 kg
Subject to change	

Characteristic curve



The oszillations at the beginning and the end of the characteristic curve are caused by the type of sensor construction.
For the characteristic curve displayed, the distance between the sensor and the bottom of the container was adjusted to 330 mm.