

## Ultrasonic sensors

Maximum functionality even under difficult operating conditions

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## Ultrasonic sensors

BERNSTEIN ultrasonic sensors provide excellent repeatability and linearity in detecting the precise position of objects. The sensors provide high precision performance on any material of any colour, irrespective of external light levels.

They produce accurate results even when used with highly transparent objects such as film or glass surfaces and are completely unaffected by normal levels of soiling on the sensor surface. The sensors are also characterised by high sound intensity that makes it possible to detect even the smallest of objects with extremely high reliability.

This ability to maintain outstanding performance and reliability, even with the presence of suspended particles or water vapour, means that BERNSTEIN ultrasonic sensors are in daily use all over the World in a diverse range of demanding industrial applications.

## Advantages

- Large detection range of up to 6000 mm (depending on design)
- High linearity
- High repeatability
- Narrow sound beam of 8°
- Adaptive 0–10 V voltage or 4–20 mA current output (analogue sensors)
- Two switching outputs, can be used independently or together (switching sensors)
- IP 67 type of protection

## 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.



## Product range

### Analogue output

Article number		Design	Detection range	Output U/I	Resolution	Linearity error	No-load current I <sub>0</sub>
2 m cable	M12 connector						
6711402005	6712402005	M18x1	30 – 400 mm	0 à 10 V	0,13 mm	< 0,3 %	< 45 mA
6711302005	6712302005	M18x1	30 – 400 mm	4 à 20 mA	0,13 mm	< 0,5 %	< 45 mA
6711402004	6712402004	M18x1	60 – 500 mm	0 à 10 V	0,25 mm	< 0,3 %	< 40 mA
6711302004	6712302004	M18x1	60 – 500 mm	4 à 20 mA	0,25 mm	< 0,3 %	< 40 mA
6711402002	6712402002	M18x1	80 – 1600 mm	0 à 10 V	1 mm	< 0,5 %	< 30 mA
6711302002	6712302002	M18x1	80 – 1600 mm	4 à 20 mA	1 mm	< 0,5 %	< 30 mA
6711402001	6712402001	M18x1	200 – 2000 mm	0 à 10 V	1 mm	< 0,3 %	< 40 mA
6711302001	6712302001	M18x1	200 – 2000 mm	4 à 20 mA	1 mm	< 0,3 %	< 40 mA
6711403001	6712403001	M30x1,5	300 – 3500 mm	0 à 10 V	1 mm	< 0,5 %	< 35 mA
6711303001	6712303001	M30x1,5	300 – 3500 mm	4 à 20 mA	1 mm	< 0,5 %	< 35 mA
	6713411001	40,5x26x12 mm	25 – 250 mm	0 à 10 V	0,13 mm	< 0,3 %	< 45 mA
	6712412001	80x80x50 mm	60 – 6000 mm	0 à 10 V	1,5 mm	< 0,5 %	< 35 mA
	6712312001	80x80x50 mm	60 – 6000 mm	4 à 20 mA	1,5 mm	< 0,5 %	< 35 mA

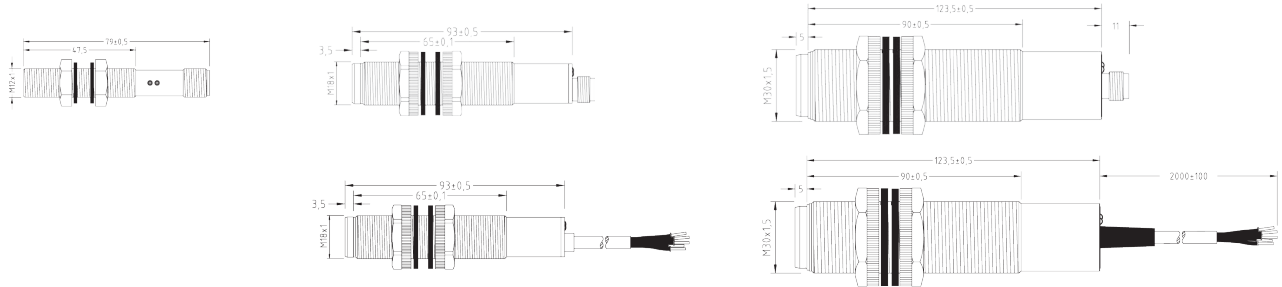
### Switching output

Article number		Design	Detection range	Output U/I	f	I <sub>i</sub>	No-load current I <sub>0</sub>
2 m cable	M12 connector						
	6712101001	M12x1	25 – 200 mm	1 PNP	30 Hz	< 100 mA	< 100 mA
	6712201001	M12x1	25 – 200 mm	1 NPN	30 Hz	< 100 mA	< 100 mA
6711102005	6712102005	M18x1	30 – 400 mm	2 PNP	15 Hz	< 500 mA	< 80 mA
6711202005	6712202005	M18x1	30 – 400 mm	2 NPN	15 Hz	< 500 mA	< 80 mA
6711102004	6712102004	M18x1	60 – 500 mm	2 PNP	5 Hz	< 500 mA	< 80 mA
6711202004	6712202004	M18x1	60 – 500 mm	2 NPN	5 Hz	< 500 mA	< 80 mA
6711102002	6712102002	M18x1	80 – 1600 mm	2 PNP	7 Hz	< 500 mA	< 60 mA
6711202002	6712202002	M18x1	80 – 1600 mm	2 NPN	7 Hz	< 500 mA	< 60 mA
6711102001	6712102001	M18x1	200 – 2000 mm	2 PNP	2 Hz	< 500 mA	< 35 mA
6711202001	6712202001	M18x1	200 – 2000 mm	2 NPN	2 Hz	< 500 mA	< 35 mA
6711103001	6712103001	M30x1,5	300 – 3500 mm	2 PNP	0,5 Hz	< 500 mA	< 80 mA
6711203001	6712203001	M30x1,5	300 – 3500 mm	2 NPN	0,5 Hz	< 500 mA	< 80 mA
	6713111001	40,5x26x12 mm	25 – 250 mm	1 PNP	25 Hz	< 100 mA	< 100 mA
	6713211001	40,5x26x12 mm	25 – 250 mm	1 NPN	25 Hz	< 100 mA	< 100 mA
	6712112001	80x80x50 mm	60 – 6000 mm	2 PNP	0,5 Hz	< 500 mA	< 80 mA
	6712212001	80x80x50 mm	60 – 6000 mm	2 NPN	0,5 Hz	< 500 mA	< 80 mA

### Accessories

Article number	Description
4139100837	4-pin connection cable M8, cable length 2 m, straight
4139100956	5-pin connection cable M12, cable length 2 m, straight
4139100957	Teach-in adapter for sensors with M12 connector

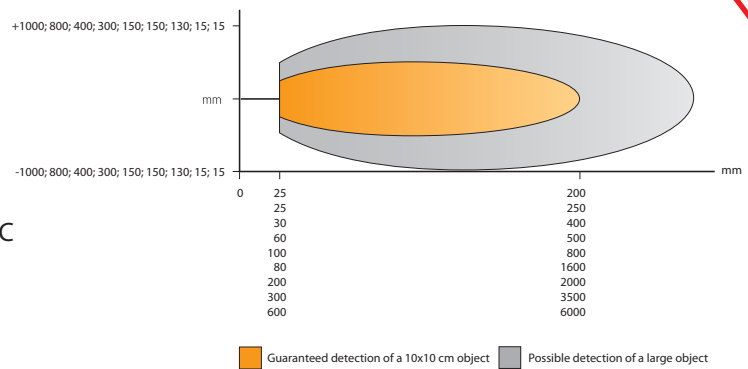
Other accessories such as 90° deflection mirror available on request.



## Technical data\*

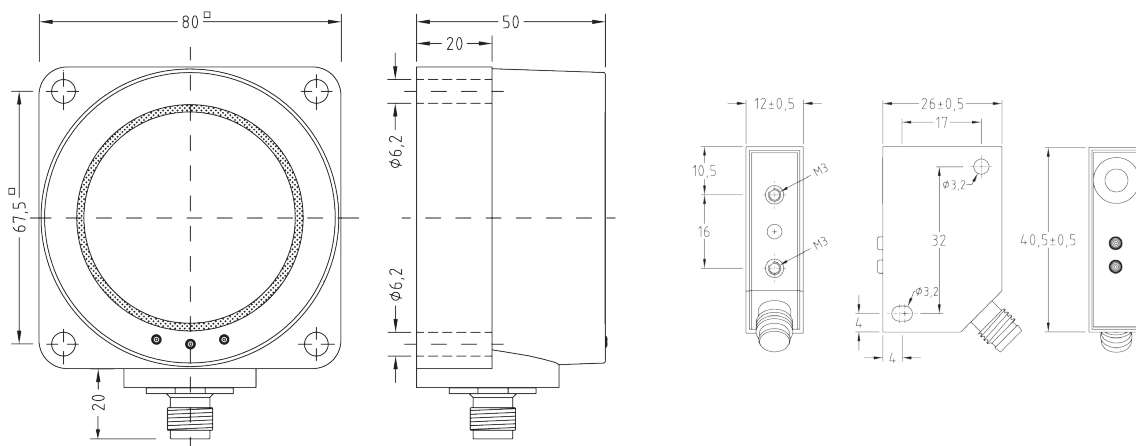
- Sound beam: 8°
- Type of protection: IP 67
- Enclosure: PBT / GF30
- Connector: M12
- Ambient temperature: -15 °C to +70 °C
- Repeatability:  $\pm 0.2\% \pm 2$  mm
- Rated operational voltage range: 12V – 30V DC
- Hysteresis: 1%

## Detection range



\* In the event of deviations, please refer to the technical datasheet.

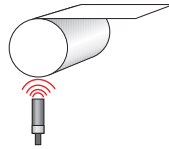
**Other products  
in our complete range**



## Applications:

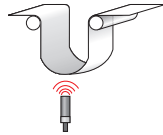
### ● Wind-on and wind-off control

Detection of the diameter of coils in the paper, plastics and textile as well as metal working industries.



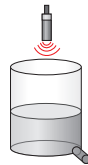
### ● Sag control

Detection of sag loop for controlling material tension or controlling quantity of material for the next production process.



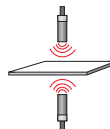
### ● Level measurement

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



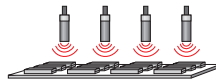
### ● Thickness measurement

Thickness measurement of objects.



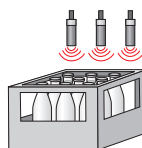
### ● Completeness check

For checking completeness of objects in containers...



### ● Completeness check of bottles in crates

For checking the presence and height of bottles in crates.



## Industries

- Machine construction
- Packing industry
- Storage systems
- Conveyor systems
- Analysis
- Handling systems
- Process technology
- Printing and paper and industry



**Switch technology –  
Economy meets safety**



**Sensor technology –  
Compact intelligence**



**Enclosure technology –  
Function and design**

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