



# Ultrasonic sensor

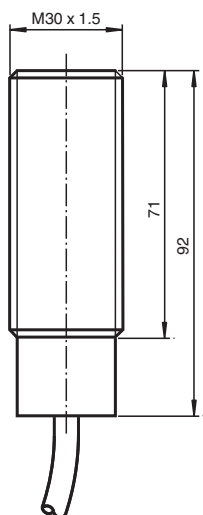
## UB2000-30GM-H3

- Separate evaluation
- Direct detection mode

Single head system



### Dimensions



### Technical Data

#### General specifications

Sensing range	80 ... 2000 mm
Adjustment range	120 ... 2000 mm
Dead band	0 ... 80 mm <sup>1)</sup>
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 180 kHz

#### Electrical specifications

Operating voltage	$U_B$	10 ... 30 V DC , ripple 10 % <sub>SS</sub>
No-load supply current	$I_0$	≤ 30 mA

#### Input

Input type	1 pulse input for transmitter pulse (clock) 0-level (active): < 5 V ( $U_B > 15$ V) 1-level (inactive): > 10 V ... + $U_B$ ( $U_B > 15$ V) 0-level (active): < 1/3 $U_B$ (10 V < $U_B < 15$ V) 1-level (inactive): > 2/3 $U_B$ ... + $U_B$ (10 V < $U_B < 15$ V)
Pulse length	20 ... 300 μs (typ. 200 μs) <sup>2)</sup>
Pause length	≥ 50 x pulse length
Impedance	10 kOhm internal connected to + $U_B$

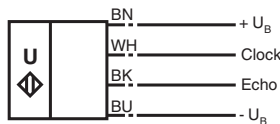
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## Technical Data

<b>Output</b>		
Output type		1 pulse output for echo run time, short-circuit proof open collector PNP with pulldown resistor = 22 kOhm level 0 (no echo): $-U_B$ level 1 (echo detected): $\geq (+U_B - 2 V)$
Rated operating current	$I_e$	15 mA , short-circuit/overload protected
Temperature influence		the echo propagation time: 0.17 % / K
<b>Compliance with standards and directives</b>		
Standard conformity		
Standards		EN IEC 60947-5-2:2020 IEC 60947-5-2:2019
<b>Approvals and certificates</b>		
UL approval		cULus Listed, General Purpose
CCC approval		CCC approval / marking not required for products rated $\leq 36 V$
<b>Ambient conditions</b>		
Ambient temperature		-25 ... 85 °C (-13 ... 185 °F)
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
<b>Mechanical specifications</b>		
Degree of protection		IP67
Connection		2 m PVC cable 0.75 mm <sup>2</sup>
Material		
Housing		nickel plated brass; plastic components: PBT
Transducer		epoxy resin/hollow glass sphere mixture; polyurethane foam
Mass		300 g
Dimensions		
Length		80 mm
Diameter		30 mm

## Connection Assignment

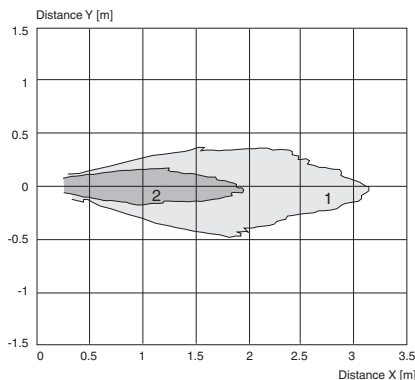
Standard symbol/Connection:  
(Transceiver)



WH = Emitter pulse input  
BK = Echo propagation time output

## Characteristic Curve

### Characteristic response curves



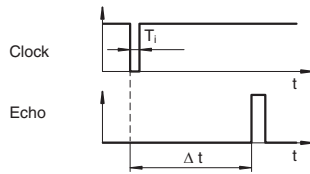
Curve 1: flat surface 100 mm x 100 mm  
Curve 2: round bar, Ø 25 mm

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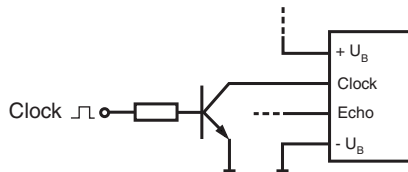
## Function Principle

The sensing range is determined in the downstream evaluation electronics such as PLC modules or other existing evaluation units.

The object distance in pulse-echo mode is obtained from the echo time  $\Delta t$ . The emission of an ultrasonic pulse starts simultaneously with the falling slope of the clock input signal.



We recommend the usage of a npn-transistor to trigger the sensors clock input. The sensors clock input is connected to the  $+U_B$  potential internally by means of a pull up resistor.



- 1) The unusable area (blind range) BR depends on the pulse duration  $T_i$ .  
The unusable area reaches a minimum with the shortest pulse duration.
- 2) The sensors detection range depends on the pulse duration  $T_i$ .  
With pulse duration  $<$  typical pulse duration, the sensors detection range may be reduced.

## Installation Conditions

If the sensor is installed in places where the operating temperature can fall below  $0\text{ }^{\circ}\text{C}$ , the BF30, BF30-F or BF 5-30 fixing clamp must be used.