



Ultrasonic sensor

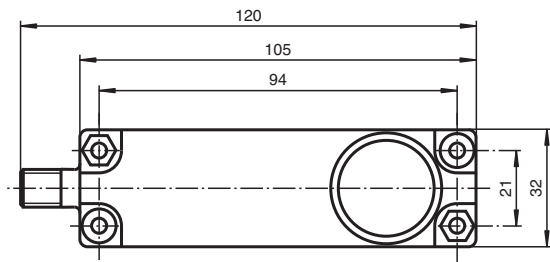
UB2000-F54-H3-V1

- Separate evaluation
- Direct detection mode

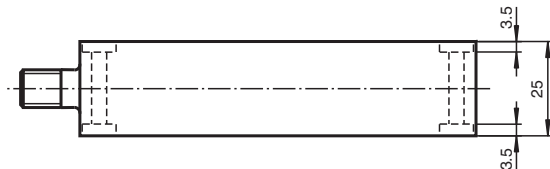
Single head system



Dimensions



Bore hole and countersinking for screws/hexagon M4



Technical Data

General specifications

Sensing range	80 ... 2000 mm
Adjustment range	100 ... 2000 mm
Dead band	0 ... 80 mm ¹⁾
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 175 kHz

Electrical specifications

Operating voltage	U_B	10 ... 30 V DC , ripple 10 % _{SS}
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) ²⁾
Pause length	≥ 50 x pulse length
Impedance	10 kOhm internal connected to + U_B

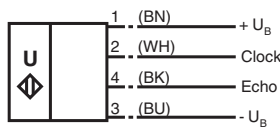
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Technical Data

Output		
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
Compliance with standards and directives		
Standard conformity		
Standards		EN IEC 60947-5-2:2020 IEC 60947-5-2:2019
Approvals and certificates		
UL approval		cULus Listed, General Purpose
CCC approval		CCC approval / marking not required for products rated $\leq 36 V$
Ambient conditions		
Ambient temperature		-25 ... 85 °C (-13 ... 185 °F)
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
Mechanical specifications		
Connection type		Connector plug
Degree of protection		IP67
Material		
Housing		ABS
Transducer		epoxy resin/hollow glass sphere mixture; polyurethane foam
Connector		
Threading		M12
Number of pins		4
Mass		110 g
Dimensions		
Height		25 mm
Width		32 mm
Length		105 mm

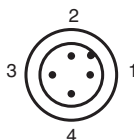
Connection Assignment

Standard symbol/Connection:



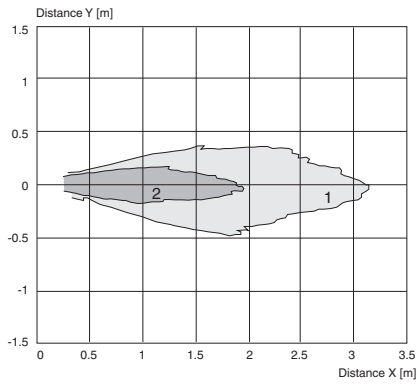
2 = Emitter pulse input
4 = Echo propagation time output
Core colours in accordance with EN 60947-5-2.

Connection Assignment



Characteristic Curve

Characteristic response curves



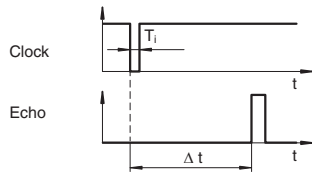
Curve 1: flat surface 100 mm x 100 mm
Curve 2: round bar, Ø 25 mm

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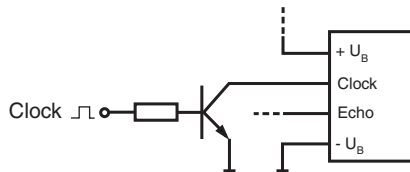
Function Principle

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 Δt . 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.

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