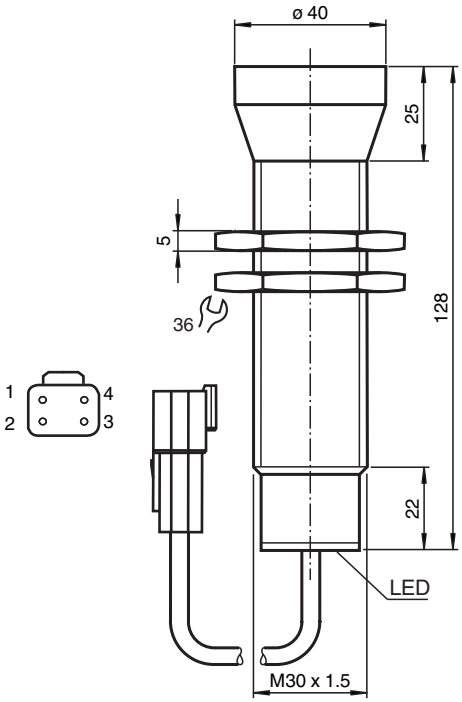
Ultrasonic sensor

UB4000-30GM-H3-4DT04

- Separate evaluation
- Direct detection mode

Single head system

Dimensions



Technical Data

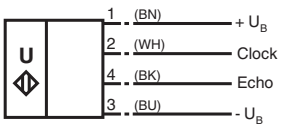
General specifications		
Sensing range		200 ... 4000 mm
Adjustment range		240 ... 4000 mm
Dead band		0 ... 200 mm [1]
Standard target plate		100 mm x 100 mm
Transducer frequency		approx. 85 kHz
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC , ripple 10 %$_{SS}$
No-load supply current	I_0	≤ 30 mA
Input		

Technical Data

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		40 ... 600 µs (typ. 500 µs) [2]
Pause length		≥ 50 x pulse length
Impedance		10 kOhm internal connected to +U_B
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): ≥ (+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		UL Recognized , General purpose , Class 2 power source
Ambient conditions		
Ambient temperature		-25 ... 85 °C (-13 ... 185 °F)
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
Mechanical specifications		
Degree of protection		IP67
Connection		Deutsch connector, 4-pin DT-04-4P with 300 mm (1 ft) cable
Material		
Housing		stainless steel (1.4305 / AISI 303) PBT plastic parts
Transducer		epoxy resin/hollow glass sphere mixture; polyurethane foam
Connector		
Connection assembly		Deutsch housing DT04-4P-C015 Pin (male) - 1060-16-0622 wedge: W4P Boot: DT4P-BT
Cable		
Length	L	300 mm
Mass		210 g
Dimensions		
Length		128 mm
Diameter		40 mm

Connection

Standard symbol/Connection:



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

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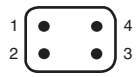
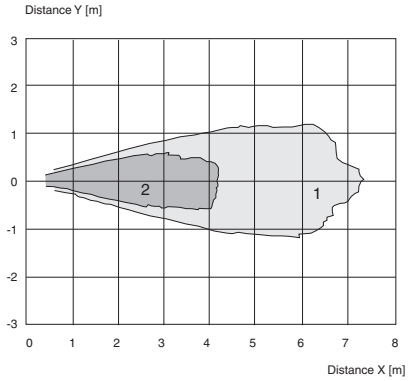
Connection Assignment

Connector 4DT04



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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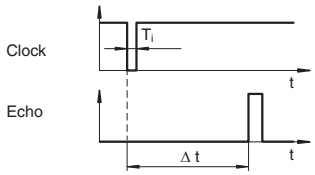
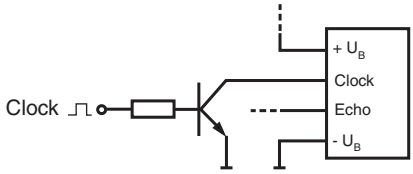
Function Principle

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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