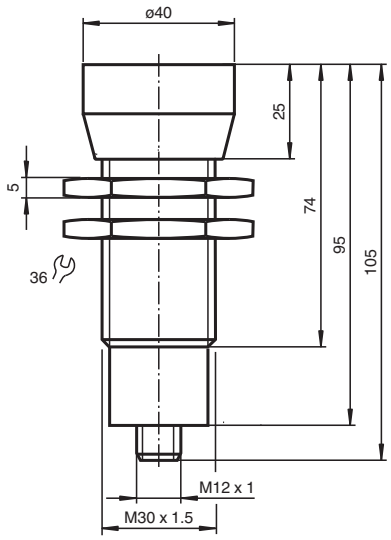
Ultrasonic sensor

UB4000-30GM-H3-V1

- 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		
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

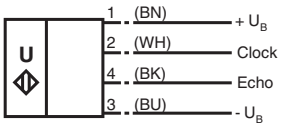
Release date: 2025-06-03 Date of issue: 2025-06-03 Filename: 130476_eng.pdf

Technical Data

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		cULus Listed, General Purpose
CCC approval		CCC approval / marking not required for products rated ≤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 M12 x 1 , 4-pin
Degree of protection		IP67
Material		
Housing		nickel plated brass; plastic components: PBT
Transducer		epoxy resin/hollow glass sphere mixture; polyurethane foam
Mass		180 g
Dimensions		
Length		93 mm
Diameter		40 mm

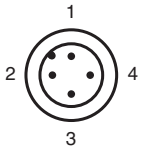
Connection Assignment

Standard symbol/Connection:



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

Connection Assignment



Release date: 2025-06-03 Date of issue: 2025-06-03 Filename: 130476_eng.pdf

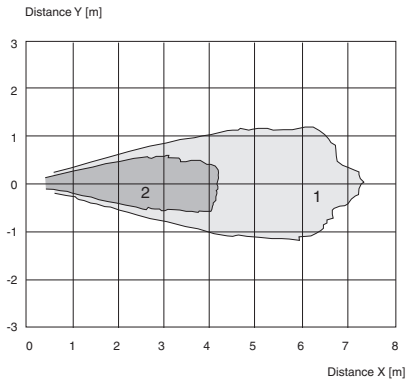
Connection Assignment

Wire colors in accordance with EN 60947-5-2

1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

Characteristic Curve

Characteristic response curves

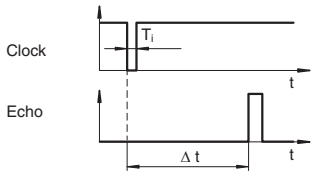


Curve 1: flat surface 100 mm x 100 mm
Curve 2: round bar, Ø 25 mm

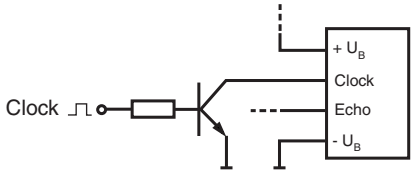
Release date: 2025-06-03 Date of issue: 2025-06-03 Filename: 130476_eng.pdf

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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