



# Ultrasonic sensor

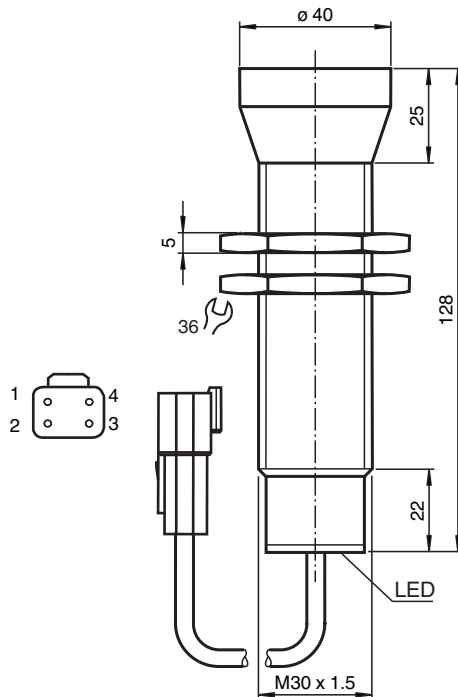
## UB4000-30GM-H3-4DT04

- 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 <sup>1)</sup> |
| 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 % <sub>SS</sub> |
| No-load supply current | $I_0$ | ≤ 30 mA                                    |

#### Input

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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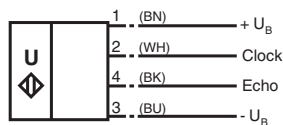
**PEPPERL+FUCHS**

## Technical Data

|                                                 |       |                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input type                                      |       | 1 pulse input for transmitter pulse (clock)<br>0-level (active): $< 5 \text{ V}$ ( $U_B > 15 \text{ V}$ )<br>1-level (inactive): $> 10 \text{ V} \dots +U_B$ ( $U_B > 15 \text{ V}$ )<br>0-level (active): $< 1/3 U_B$ ( $10 \text{ V} < U_B < 15 \text{ V}$ )<br>1-level (inactive): $> 2/3 U_B \dots +U_B$ ( $10 \text{ V} < U_B < 15 \text{ V}$ ) |
| Pulse length                                    |       | 40 ... 600 $\mu\text{s}$ (typ. 500 $\mu\text{s}$ ) <sup>2)</sup>                                                                                                                                                                                                                                                                                     |
| Pause length                                    |       | $\geq 50 \times$ pulse length                                                                                                                                                                                                                                                                                                                        |
| Impedance                                       |       | 10 kOhm internal connected to $+U_B$                                                                                                                                                                                                                                                                                                                 |
| <b>Output</b>                                   |       |                                                                                                                                                                                                                                                                                                                                                      |
| Output type                                     |       | 1 pulse output for echo run time, short-circuit proof<br>open collector PNP with pulldown resistor = 22 kOhm<br>level 0 (no echo): $-U_B$<br>level 1 (echo detected): $\geq (+U_B - 2 \text{ V})$                                                                                                                                                    |
| 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<br>IEC 60947-5-2:2019                                                                                                                                                                                                                                                                                                          |
| <b>Approvals and certificates</b>               |       |                                                                                                                                                                                                                                                                                                                                                      |
| UL approval                                     |       | UL Recognized , General purpose , Class 2 power source                                                                                                                                                                                                                                                                                               |
| <b>Ambient conditions</b>                       |       |                                                                                                                                                                                                                                                                                                                                                      |
| Ambient temperature                             |       | -25 ... 85 °C (-13 ... 185 °F)                                                                                                                                                                                                                                                                                                                       |
| Storage temperature                             |       | -40 ... 85 °C (-40 ... 185 °F)                                                                                                                                                                                                                                                                                                                       |
| <b>Mechanical specifications</b>                |       |                                                                                                                                                                                                                                                                                                                                                      |
| Housing diameter                                |       | 40 mm                                                                                                                                                                                                                                                                                                                                                |
| 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)<br>PBT plastic parts                                                                                                                                                                                                                                                                                             |
| Transducer                                      |       | epoxy resin/hollow glass sphere mixture; polyurethane foam                                                                                                                                                                                                                                                                                           |
| Connector                                       |       |                                                                                                                                                                                                                                                                                                                                                      |
| Connection assembly                             |       | Deutsch housing DT04-4P-C015<br>Pin (male) - 1060-16-0622<br>wedge: W4P<br>Boot: DT4P-BT                                                                                                                                                                                                                                                             |
| Cable                                           |       |                                                                                                                                                                                                                                                                                                                                                      |
| Length                                          | L     | 300 mm                                                                                                                                                                                                                                                                                                                                               |
| Mass                                            |       | 210 g                                                                                                                                                                                                                                                                                                                                                |

## Connection

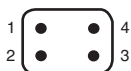
Standard symbol/Connection:



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

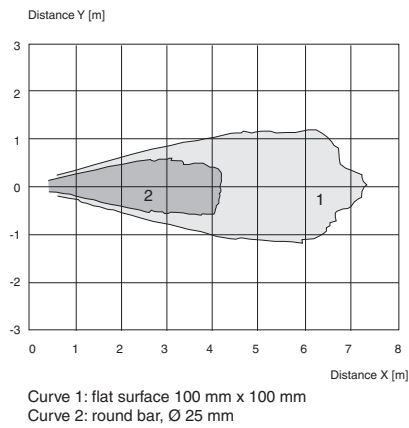
## Connection Assignment

### Connector 4DT04



Characteristic Curve

Characteristic response curves



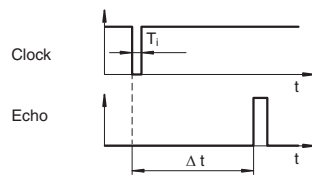
Accessories

|                                                                                   |                |                                                                                   |
|-----------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------|
|  | <b>BF 30</b>   | Mounting flange, 30 mm                                                            |
|  | <b>BF 5-30</b> | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |

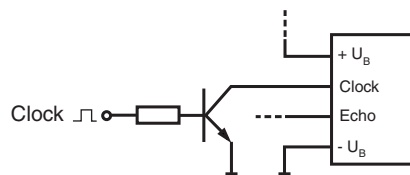
## Function Principle

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.