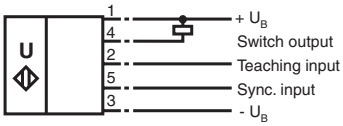
Ultrasonic sensor
UB500-30GM-E0-V15

Features

- Switch output
- 5 different output functions can be set
- TEACH-IN input
- Synchronisation options
- Deactivation option

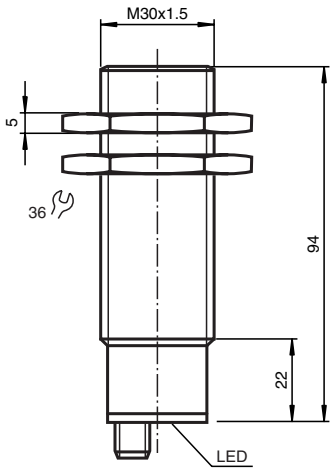
Electrical connection

Standard symbol/Connections:
(version E0, npn)



Connector V15

Dimensions



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Technical data

General specifications	
Sensing range	60 ... 500 mm
Unusable area	0 ... 60 mm
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 380 kHz
Response delay	approx. 38 ms
Indicators/operating means	
LED green	"Power on", TEACH-IN function object detected
LED yellow	indication of the switching state, TEACH-IN function-no object detected
LED red	"Error", object uncertain
Electrical specifications	
Operating voltage	20 ... 30 V DC , ripple 10 $\%_{SS}$
No-load supply current I_0	≤ 60 mA
Input	
Input type	1 TEACH-IN input, operating distance 1: $-U_B$ ... ($-U_B$ +2 V), operating distance 2: ($+U_B$ -2 V) ... $+U_B$ 1 synchronous input level 0: $-U_B$ ... ($-U_B$ + 1 V), level 1: ($-U_B$ + 5 V) ... $+U_B$ Input impedance 27 kOhm
Pulse length	Synchronisation pulse: ≥ 100 µs Synchronisation pulse pause: ≥ 100 µs
Synchronisation frequency	
Common mode operation	≤ 150 Hz
Multiplex operation	≤ 150/n Hz , n = number of sensors
Output	
Output type	1 switch output E0/E1, npn, normally open/closed, programmable
Repeat accuracy	≤ 1 %
Rated operational current I_e	200 mA , short-circuit/overload protected
Voltage drop U_d	≤ 3 V
Switching frequency f	max. 13 Hz
Range hysteresis H	≤ 1 % of the set operating distance
Temperature influence	0,17 % / K
Standard conformity	
Standards	EN 60947-5-2
Ambient conditions	
Ambient temperature	-25 ... 70 °C (248 ... 343 K)
Storage temperature	-40 ... 85 °C (233 ... 358 K)
Mechanical specifications	
Protection degree	IP65
Connection	connector V15 (M12 x 1), 5 pin
Material	
Housing	brass, nickel-plated, plastic components PBT
Transducer	epoxy resin/hollow glass sphere mixture; polyurethane foam
Mass	145 g

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Notes

Model number

UB500-30GM-E0-V15

Function

Synchronization
The sensor features a synchronization input for the suppression of mutual interference. It can be synchronized by applying a square wave voltage. The falling edge of a synchronization pulse at the synchronization input starts a measuring cycle. A low level > 1 s or an open synchronization input will result in the non-synchronized normal operation of the sensor. A high level at the synchronization input disables the sensor. Synchronization cannot be performed during TEACH-IN and vice versa.

Two operating modes are possible:

1. The sync. inputs of 2 ... 5 Sensors are connected with each other. The sensors synchronize themselves and operate cyclically (multiplex mode).
2. Multiple sensors can be controlled by the same synchronization signal. The sensors are synchronized.
3. The synchronization pulses are sent cyclically to individual sensors. The sensors operate in multiplex mode.

In case of synchronized operation, the response time of the sensor increases due to a longer measuring cycle time caused by synchronization.

Note:

If the option for synchronization is not used, the synchronization input has to be connected to ground (0V) or the sensor has to be operated via a V1 cable connector (4-pin).

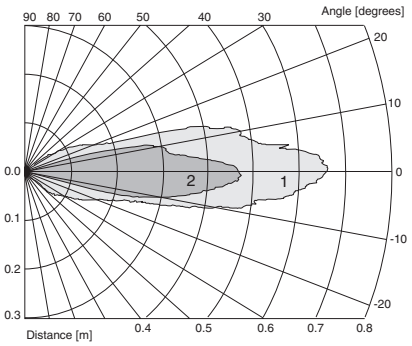
Setting the switching points
The ultrasonic sensor features a switch output with two teachable switching points. These are set by applying the supply voltage -UB or +UB to the TEACH-IN input. The supply voltage must be applied to the TEACH-IN input for at least 1 s. LEDs indicate whether the sensor has recognised the target during the TEACH-IN procedure. Switching point A1 is taught with -UB, A2 with +UB.

Five different output functions can be set:

Function	TEACH-IN procedure
Window mode, close function	- Set object to near switching point - Teach switching point A1 with -UB - Set object to far switching point - Teach switching point A2 with +UB
Window mode, open function	- Set object to near switching point - Teach switching point A2 with +UB - Set object to far switching point - Teach switching point A1 with -UB
1 switching point, close function	- Set object to near switching point - Teach switching point A2 with +UB - Cover sensor or remove all objects from sensing range - Teach switching point A1 with -UB
1 switching point, open function	- Set object to near switching point - Teach switching point A1 with -UB - Cover sensor or remove all objects from sensing range - Teach switching point A2 with +UB
Detection of object presence	- Cover sensor or remove all objects from sensing range - Teach switching point A1 with -UB - Teach switching point A2 with +UB

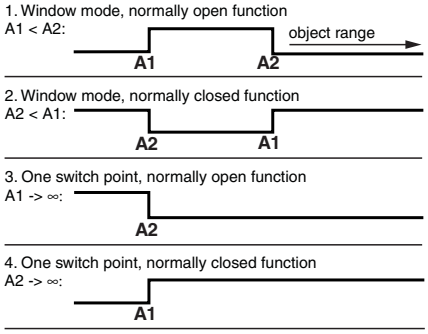
Characteristic curves/additional information

Characteristic response curves



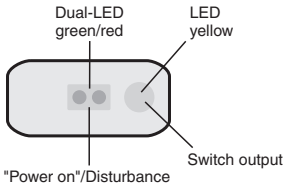
Curve 1: flat plate 100 mm x 100 mm
Curve 2: round bar, Ø 25 mm

Programmed switching output function



5. A1 -> ∞, A2 -> ∞: Detection of object presence
Object detected: Switch output closed
No object detected: Switch output open

LED-Window



Default setting of switching points: A1 = blind range, A2 = nominal distance

Displays in dependence on operating mode	Green LED	Red LED	Yellow LED
Teach switching point Object detected No object detected Object uncertain (TEACH-IN invalid)	 Flashing Flashing Off	 Off Off Flashing	 Off On Off
Normal operation	On	Off	Switching state
Interference (e.g. compressed air)	Off	Flashing	Previous state