

Ultrasonic sensor UB4000-30GM-E2-V15

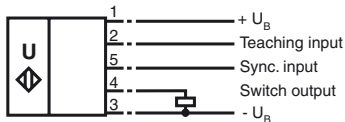


Features

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

Electrical connection

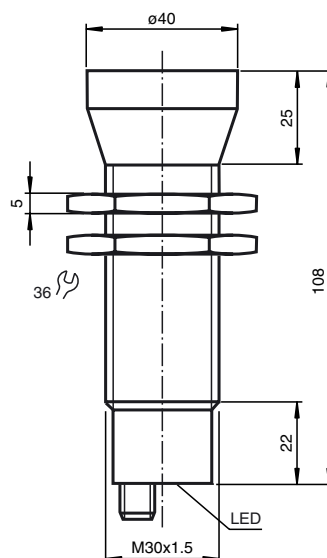
Standard symbol/Connections:
(version E2, pnp)



Connector V15



Dimensions



Technical data



General specifications

Sensing range	500 ... 4000 mm
Unusable area	0 ... 500 mm
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 85 kHz
Response delay	approx. 280 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 Synchronisation pulse: ≥ 100 μs Synchronisation pulse pause: ≥ 100 μs
Pulse length	

Synchronisation frequency	≤ 20 Hz
Common mode operation	≤ 20/n Hz , n = number of sensors
Multiplex operation	

Output

Output type	1 switch output E2/E3, pnp, 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. 1.7 Hz
Range hysteresis H	≤ 1 % of the set operating distance
Temperature influence	0.17 % / K

Standard conformity

Standards	EN 60947-5-2
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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	180 g

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

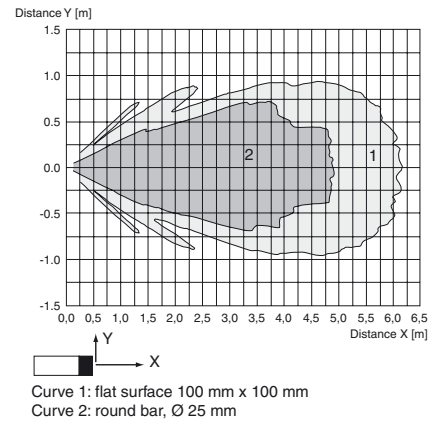
The ultrasonic sensor features a switch output with two teachable switching points. These are set by applying the supply voltage -UB or +UB to the TEACH-IN input. The supply voltage must be applied to the TEACH-IN input for at least 1 s. LEDs indicate whether the sensor has recognised the target during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

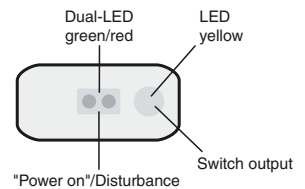
Characteristic response curve



Programmed switching output function

1. Window mode, normally open function
A1 < A2:
2. Window mode, normally closed function
A2 < A1:
3. One switch point, normally open function
A1 -> ∞:
4. One switch point, normally closed function
A2 -> ∞:
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	Flashing	Off	Off
No object detected	Flashing	Off	On
Object uncertain (TEACH-IN invalid)	Off	Flashing	Off
Normal operation	On	Off	Switching state
Interference (e.g. compressed air)	Off	Flashing	Previous state