CE

Order Code

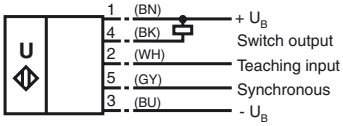
UB4000-30GM-E4-V15

Features

- Switch output
- 5 different output functions can be set
- TEACH-IN input
- Synchronisation options
- Deactivation option
- Temperature compensation
- Insensitive to compressed air

Electrical Connection

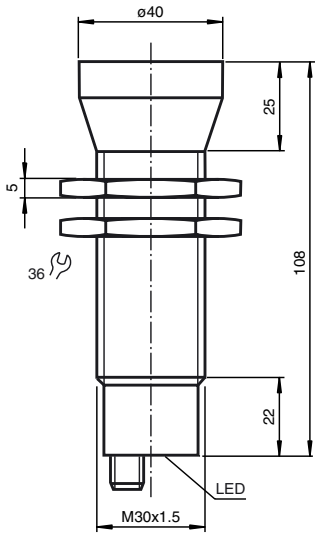
Standard symbol/Connections:
(version E4, npn)



Core colours in accordance with EN 60947-5-2.

Connector V15

Dimensions



Technical Data

General specifications	
Sensing range	200 ... 4000 mm
Adjustment range	240 ... 4000 mm
Unusable area	0 ... 200 mm
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 85 kHz
Response delay	approx. 325 ms
Indicators/operating means	
LED green	permanent: Power-on flashing: TEACH-IN function object detected
LED yellow	permanent: switching state switch output flashing: TEACH-IN function
LED red	normal operation: "fault" TEACH-IN function: no object detected
Electrical specifications	
Operating voltage U_B	10 ... 30 V DC , ripple 10 $\%_{SS}$
No-load supply current I_0	≤ 50 mA
Input/output	
Synchronisation	bi-directional 0 level -U_B...+1 V 1 level: +4 V...+U_B input impedance: > 12 KOhm synchronisation pulse: ≥ 100 µs, synchronisation interpulse period: ≥ 2 ms
Synchronisation frequency	
Common mode operation	≤ 13 Hz
Multiplex operation	≤ 13/n Hz, n = number of sensors
Input	
Input type	1 TEACH-IN input, operating range 1: -U_B ... +1 V, operating range 2: +4 V ... +U_B input impedance: > 4.7 kΩ; TEACH-IN pulse: ≥ 1 s
Output	
Output type	1 switch output E4, npn NO/NC, parameterisable
Rated operational current I_e	200 mA , short-circuit/overload protected
Voltage drop U_d	≤ 2.5 V
Repeat accuracy	≤ 0.5 % of switching point
Switching frequency f	≤ 1.5 Hz
Range hysteresis H	1 % of the set operating distance
Temperature influence	< 2 % of full-scale value
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	180 g

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Description of sensor functions

Synchronization

This sensor features a synchronization input for the possible suppression of ultrasonic mutual interference. If this input is not connected, the sensor will operate using internally generated clock pulses. The synchronization of multiple sensors can be achieved as follows:

External synchronization:
The sensor can be synchronized by applying an external square wave. A synchronization pulse on the synchronization input starts a measuring cycle. The pulse must be longer than 100 ?s. The measuring cycle starts with the falling edge of the synchronization pulse. Two operating modes are available:
1. Multiple sensors can be controlled by the same synchronization signal. The sensors are synchronized.
2. A separate synchronization pulse can be sent to each individual sensor. The sensors operate in multiplex mode.

Internal synchronization:
The synchronization connections of up to 5 sensors capable of internal synchronization are connected to one another. When power is applied, these sensors will operate in multiplex mode. The sensors stagger their ultrasonic bursts to eliminate the possibility of 2 or more units simultaneously sending or receiving signals.
If the synchronization signal remains low for > 1 second, the sensor will operate in normal mode.
Synchronization cannot be performed during PROGRAMMING and vice versa. The sensors must be operated in an unsynchronized manner to program the switch point.
A high level on the synchronization input disables the sensor.

Note:
If the option for synchronization is not used, the synchronization input must be connected to ground (0V) or the sensor must be operated using a V1 cordset (4-pin).

Programming the switch points

The ultrasonic sensor features a discrete output with two teachable evaluation limits. These are set by applying the supply voltage $-U_B$ or $+U_B$ to the PROGRAMMING input. The supply voltage must be applied to the PROGRAMMING input for at least 1 s. LED's indicate whether the sensor detected the target during the PROGRAMMING procedure. Evaluation limit A1 is taught with $-U_B$, A2 with $+U_B$. For easy programming, the handheld programmer UB-PROG2 can be used.

Five different output functions can be set:
1. Window mode, normally open function
2. Window mode, normally closed function
3. Single switch point, normally open function
4. Single switch point, normally closed function
5. Object presence detection

PROGRAMMING window mode, normally open function
- Set target to near switch point
- PROGRAM switch point A1 with $-U_B$
- Set target to far switch point
- PROGRAM switch point A2 with $+U_B$

PROGRAMMING window mode, normally closed function
- Set target to near switch point
- PROGRAM switch point A2 with $+U_B$
- Set target to far switch point
- PROGRAM switch point A1 with $-U_B$

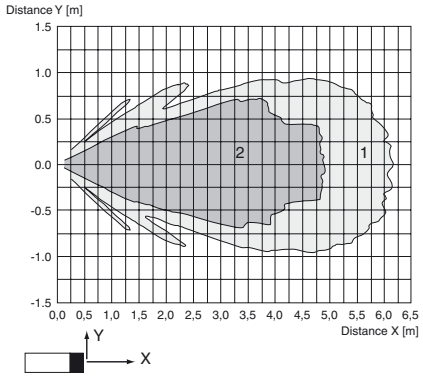
PROGRAMMING single switch point, normally open function
- Set target to near switch point
- PROGRAM switch point A2 with $+U_B$
- Cover sensor with hand or remove all objects from sensing range
- PROGRAM switch point A1 with $-U_B$

PROGRAMMING single switch point, normally closed function
- Set target to near switch point
- PROGRAM switch point A1 with $-U_B$
- Cover sensor with hand or remove all objects from sensing range
- PROGRAM switch point A2 with $+U_B$

PROGRAMMING object presence detection
- Cover sensor with hand or remove all objects from sensing range

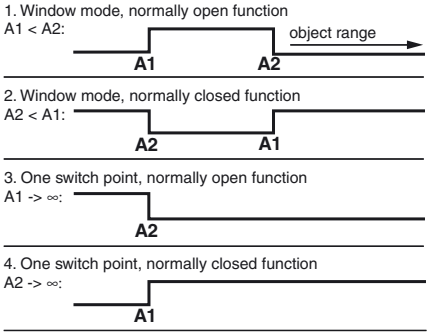
Characteristic Curves/Additional Information

Characteristic response curve



Curve 1: flat surface 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

Accessories

BF 30
Mounting flange

BF 5-30
Mounting flange

UB-PROG2
Programming unit

V15-G-2M-PVC
Cable connector

V15-W-2M-PUR
Cable connector

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- PROGRAM switch point A1 with $-U_B$
- PROGRAM switch point A2 with $+U_B$

Default setting

A1: unusable area
A2: nominal sensing range

LED Displays

Displays in dependence on operating mode	Green LED	Red LED	Yellow LED
PROGRAMMING mode Object detected No object detected Object uncertain (PROGRAMMING invalid)	 flashes off off	 off flashes flashes	 flashes flashes off
Normal operation	on	off	switching state
Interference	off	flashes	previous state

LED-Window