Dimensions

Membrane keys

LED window

Order Code

UB2000-F42-UE6-V15

Features

- 2 independent switch outputs
- NO/NC selectable
- Analogue output 0 V ... 10 V (rising/falling slope can be set)
- Extremely small unusable area
- TEACH-IN
- Interference suppression (adjustable width of sound cone in close range)
- Temperature compensation

Electrical Connection

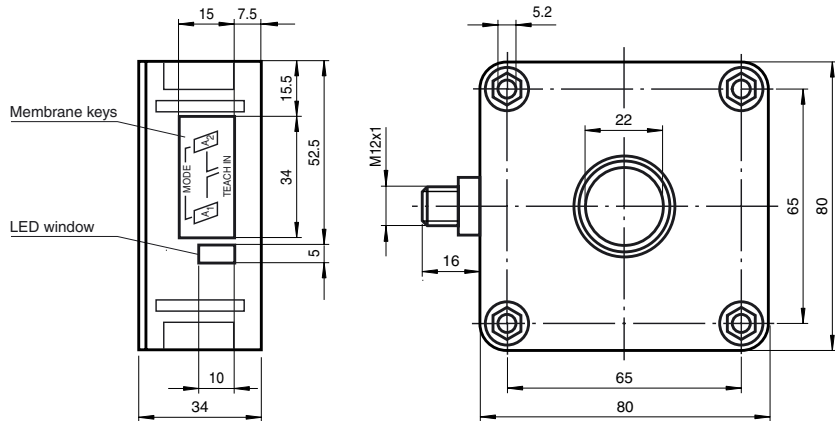**Standard symbol/Connections:**
(version UE6, pnp)

Pin	Colour	Function
1	(BN)	+ U_B
5	(GY)	Analogue output
4	(BK)	Switch output 1
2	(WH)	Switch output 2
3	(BU)	- U_B
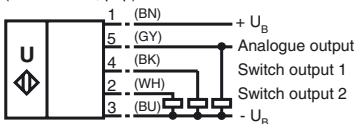
Core colours in accordance with EN 60947-5-2.

Connector V15

Technical Data

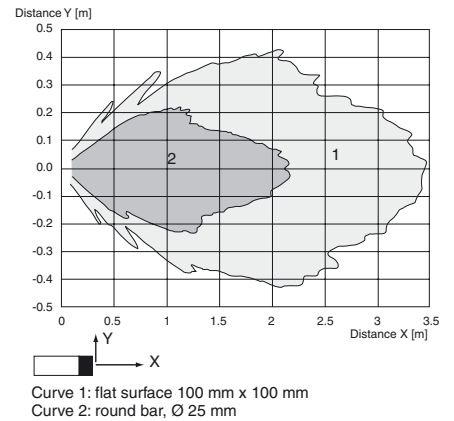| General specifications	
Sensing range	60 ... 2000 mm
Adjustment range	90 ... 2000 mm
Unusable area	0 ... 60 mm
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 175 kHz
Response delay	approx. 150 ms
Indicators/operating means	
LED yellow 1	permanent: switching state switch output 1 flashing: TEACH-IN function analogue output
LED yellow 2	permanent: switching state switch output 2 flashing: TEACH-IN function switch output
LED red	normal operation: "fault" TEACH-IN function: no object detected
Electrical specifications	
Operating voltage	17 ... 30 V DC , ripple 10 %$_{SS}$
No-load supply current I_0	≤ 50 mA
Output	
Output type	2 switch outputs pnp, normally open/close selectable 1 analogue output 0 ... 10 V
Rated operational current I_e	200 mA , short-circuit/overload protected
Voltage drop U_d	≤ 2.5 V
Resolution	0.7 mm at max. sensing range
Deviation of the characteristic curve	± 1 % of full-scale value
Repeat accuracy	switch output: ≤ 0.5 % of switching point Analogue output: ± 0.1 % of full-scale value
Switching frequency f	≤ 3 Hz
Range hysteresis H	1 % of the set operating distance
Load impedance	> 1 kOhm
Temperature influence	± 1 % 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	IP54
Connection	connector V15 (M12 x 1), 5 pin
Material	
Housing	PBT
Transducer	epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
Mass	140 g

TEACH-IN for evaluation limits (analogue output)

LED layout

○ yellow (ye)
○ red (rd)
○ yellow (ye)

Evaluation limit 1

Position the target object at the desired position/distance. Press the A1 key > 2 s (time lock)	> 2 s	Target detected	Target not detected
		● (ye) ○ ○ or	○ ● (rd) ○
		Correct the object position or sensor alignment until object is detected within 5 minutes.	
Acknowledge with kex A1 when target is detected.			The value of the object distance will be stored as evaluation limit 1.

Evaluation limit 2

Position the target object at the desired position/distance. Press the A1 key > 2 s (time lock)	> 2 s		Target not detected
		● (ye) ○ ○ or	○ ● (rd) ○
		Correct the object position or sensor alignment until object is detected within 5 minutes.	
Acknowledge with kex A2 when target is detected.			The value of the object distance will be stored as evaluation limit 2.

If TEACH-IN mode is not acknowledged within 5 minutes, the sensor goes back into normal mode and retains the last values to be stored.
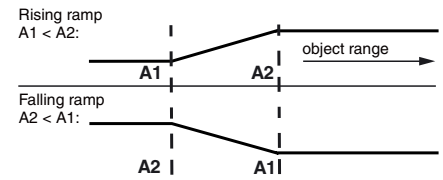
TEACH-IN for switching points (switching outputs)

LED layout

○ yellow (ye)
○ red (rd)
○ yellow (ye)

Switching output 1

Position the target object at the desired position/distance. Press the A2 key > 2 s (time lock).	> 2 s	Target detected	Target not detected
		○ ○ ● (ye) or	○ ● (rd) ○
		Correct the object position or sensor alignment until object is detected within 5 minutes.	
Acknowledge with key A1 when target is detected.			The value of the object distance will be stored as switching point 1.

Switching output 2

Position the target object at the desired position/distance. Press the A2 key > 2 s (time lock).	> 2 s		Target not detected
		○ ○ ● (ye) or	○ ● (rd) ○
		Correct the object position or sensor alignment until object is detected within 5 minutes.	
Acknowledge with key A2 when target is detected.			The value of the object distance will be stored as switching point 2.

If TEACH-IN mode is not acknowledged within 5 min., the sensor goes back into normal mode and retains the last values to be stored.
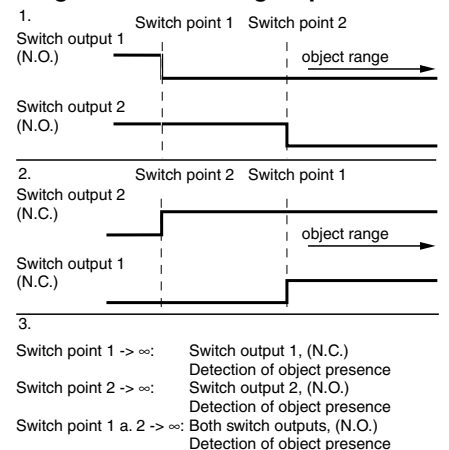
Characteristic Curves/Additional Information

Characteristic response curve

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

Programmed analogue output function

Rising ramp A1 < A2:
A1   A2   object range

Falling ramp A2 < A1:
A2   A1

Programmed switching output function

1.
Switch output 1 (N.O.)   Switch point 1   Switch point 2   object range
Switch output 2 (N.O.)

2.
Switch output 2 (N.C.)   Switch point 2   Switch point 1   object range
Switch output 1 (N.C.)

3.
Switch point 1 -> ∞:   Switch output 1, (N.C.) Detection of object presence
Switch point 2 -> ∞:   Switch output 2, (N.O.) Detection of object presence
Switch point 1 a. 2 -> ∞: Both switch outputs, (N.O.) Detection of object presence

Note Switch point -> ∞ means: cover sensor with hand or remove all objects from sensing range
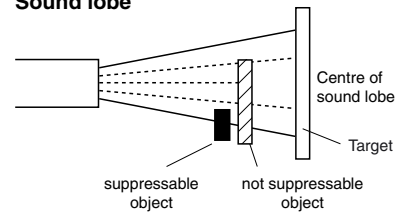
Interference target masking

Interference target masking can be adjusted in 24 steps. Each brief keystroke on (A1) increase or (A2) decreases the limit value.
Permanently lighting red LED max. or min. adjustment limit.

What is an interference target

- Small distance to the sensor as the actual target
- must not completely cover the actual goal
- The amplitude of the interference signal must be less than the amplitude of the usable signal.
- The interference target must be positioned only at the edge of the sound lobe and not in the center.

Sound lobe

Centre of sound lobe

Target

suppressable object   not suppressable object

Limit value after adjustment of the interference target

Target

24 Stages

Interference target

Limit value for interference target masking

Interference target masking			LED layout
			○ yellow (ye) ○ red (rd) ○ yellow (ye)
Remove the target object from the detection range.			
Turn off the operating voltage Hold down both keys while turning on the operating voltage The interference target masking mode is now active		Interference target detected (ye)	
Adjust the limit value **Please note:** Press the keys only briefly. When the end of the adjustable range is reached, the red LED is lit continuously	 A1: Raise the limit A2: Lower the limit	Interference target detected (ye) ---> Limit value OK (rd) min/max (rd)	
Press both keys briefly		Exit interference mode, store the target value.	
Check target detection			
If interference target mode is not acknowledged within 5 min., the sensor goes back into normal mode and retains the last values to be stored.			