

Ultrasonic sensor

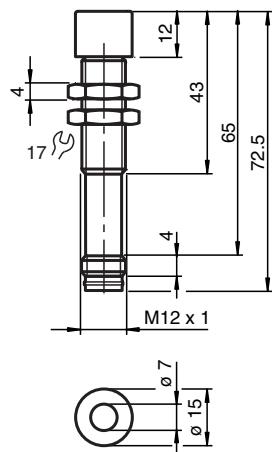
UBC250-12GM-E5-V1



- High chemical resistance through PTFE coated transducer surface
- Stainless Steel enclosure
- 1 switch output
- Temperature compensation
- Programmable output functions
- Program input



Dimensions



Technical Data

General specifications

| | |
|-----------------------|-----------------|
| Sensing range | 30 ... 250 mm |
| Adjustment range | 50 ... 250 mm |
| Dead band | 0 ... 30 mm |
| Standard target plate | 100 mm x 100 mm |
| Transducer frequency | approx. 310 kHz |
| Response delay | approx. 50 ms |

Electrical specifications

| | | |
|------------------------|-------|---|
| Operating voltage | U_B | 10 ... 30 V DC, ripple 10 % _{ss} |
| No-load supply current | I_0 | $\leq 30 \text{ mA}$ |

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

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Technical Data

Input

| | | |
|------------|---|--|
| Input type | 1 program input lower evaluation limit A1: $-U_B \dots +1$ V, upper evaluation limit A2: $+4$ V $\dots +U_B$ input impedance: > 4.7 k Ω , pulse duration: ≥ 1 s | |
|------------|---|--|

Output

| | | |
|-------------|--|--|
| Output type | 1 switch output PNP Normally open/closed, programmable | |
|-------------|--|--|

| | | |
|-------------------------|-------|--|
| Rated operating current | I_e | 100 mA, short-circuit/overload protected |
|-------------------------|-------|--|

| | | |
|-----------------|--|--|
| Default setting | Switch point A1: 50 mm Switch point A2: 250 mm | |
|-----------------|--|--|

| | | |
|--------------|-------|------------|
| Voltage drop | U_d | ≤ 3 V |
|--------------|-------|------------|

| | | |
|-----------------|------------|--|
| Repeat accuracy | ≤ 1 % | |
|-----------------|------------|--|

| | | |
|---------------------|-----|-------------|
| Switching frequency | f | ≤ 8 Hz |
|---------------------|-----|-------------|

| | | |
|------------------|-----|-----------------------------------|
| Range hysteresis | H | 1 % of the set operating distance |
|------------------|-----|-----------------------------------|

| | | |
|-----------------------|---------------------------------|--|
| Temperature influence | ± 1.5 % of full-scale value | |
|-----------------------|---------------------------------|--|

Compliance with standards and directives

| | | |
|---------------------|--|--|
| Standard conformity | | |
|---------------------|--|--|

| | |
|-----------|---|
| Standards | EN IEC 60947-5-2:2020 IEC 60947-5-2:2019 |
|-----------|---|

Approvals and certificates

| | |
|-------------|------------------------------------|
| UL approval | cULus Listed, Class 2 Power Source |
|-------------|------------------------------------|

| | |
|--------------|--|
| CCC approval | CCC approval / marking not required for products rated ≤ 36 V |
|--------------|--|

Ambient conditions

| | |
|---------------------|---|
| Ambient temperature | $-25 \dots 70$ °C ($-13 \dots 158$ °F) |
|---------------------|---|

| | |
|---------------------|---|
| Storage temperature | $-40 \dots 85$ °C ($-40 \dots 185$ °F) |
|---------------------|---|

Mechanical specifications

| | |
|-----------------|-------------------------------|
| Connection type | Connector plug M12 x 1, 4-pin |
|-----------------|-------------------------------|

| | |
|------------------|-------|
| Housing diameter | 12 mm |
|------------------|-------|

| | |
|----------------------|--------------|
| Degree of protection | IP68 / IP69K |
|----------------------|--------------|

| | |
|----------|--|
| Material | |
|----------|--|

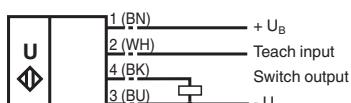
| | |
|---------|--|
| Housing | Stainless steel 1.4404 / AISI 316L O-ring for cover seal: Viton |
|---------|--|

| | |
|------------|--------------------------|
| Transducer | PTFE (diaphragm surface) |
|------------|--------------------------|

| | |
|------|------|
| Mass | 35 g |
|------|------|

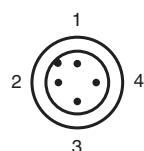
Connection

Standard symbol/Connections:
(version E5, npn)



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

Connection Assignment



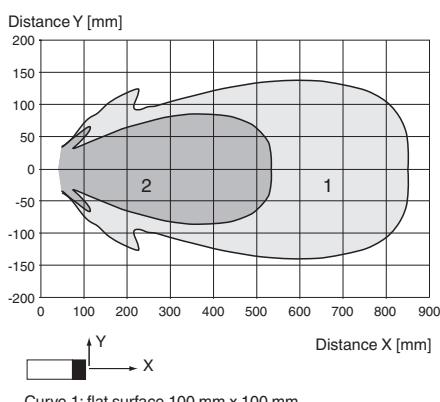
Connection Assignment

Wire colors in accordance with EN 60947-5-2

| | | |
|---|----|---------|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |

Characteristic Curve

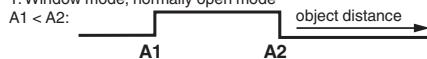
Characteristic response curve



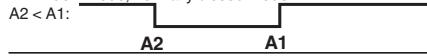
Curve 1: flat surface 100 mm x 100 mm
 Curve 2: round bar, Ø 25 mm

Programmable output modes

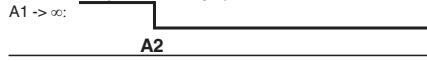
1. Window mode, normally open mode



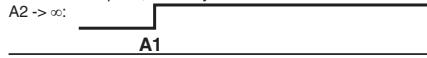
2. Window mode, normally closed mode



3. One switch point, normally open mode



4. One switch point, normally closed mode



5. A1 -> ∞, A2 -> ∞: Object presence detection mode

Object detected: Switch output closed

No object detected: Switch output open

Accessories

| | | |
|---|--------------------|---|
|  | UB-PROG2 | Programming unit |
|  | BF 5-30 | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
|  | BF 12 | Mounting flange, 12 mm |
|  | V1-G-2M-PVC | Female cordset single-ended M12 straight A-coded, 4-pin, PVC cable grey |

Accessories

| | | |
|---|--------------------|---|
|  | V1-W-2M-PUR | Female cordset single-ended M12 angled A-coded, 4-pin, PUR cable grey |
|  | UVW90-M12 | Ultrasonic -deflector |
|  | M12K-VE | Plastic nuts with centering ring for the vibration-free mounting of cylindrical sensors |

Additional Information

Adjusting the switching points

The ultrasonic sensor features a switch output with two teachable switching points. These are set by applying the supply voltage $-U_B$ or $+U_B$ to the TEACH-IN input. The supply voltage must be applied to the TEACH-IN input for at least 1 s. Switching point A1 is taught with $-U_B$, A2 with $+U_B$.

Five different output functions can be set

1. Window mode, normally-open function
2. Window mode, normally-closed function
3. one switching point, normally-open function
4. one switching point, normally-closed function
5. Detection of object presence

TEACH-IN window mode, normally-open function

- Set target to near switching point
- TEACH-IN switching point A1 with $-U_B$
- Set target to far switching point
- TEACH-IN switching point A2 with $+U_B$

TEACH-IN window mode, normally-closed function

- Set target to near switching point
- TEACH-IN switching point A2 with $+U_B$
- Set target to far switching point
- TEACH-IN switching point A1 with $-U_B$

TEACH-IN switching point, normally-open function

- Set target to near switching point
- TEACH-IN switching point A2 with $+U_B$
- Cover sensor with hand or remove all objects from sensing range
- TEACH-IN switching point A1 with $-U_B$

TEACH-IN switching point, normally-closed function

- Set target to near switching point
- TEACH-IN switching point A1 with $-U_B$
- Cover sensor with hand or remove all objects from sensing range
- TEACH-IN switching point A2 with $+U_B$

TEACH-IN detection of objects presence

- Cover sensor with hand or remove all objects from sensing range
- TEACH-IN switching point A1 with $-U_B$
- TEACH-IN switching point A2 with $+U_B$

Default setting of switching points

A1 = blind range, A2 = nominal distance

Additional Information

If the sensor is installed at places, where the environment temperature can fall below 0 °C, for the sensors fixation, one of the mounting flanges BF 12, BF 12-F or BF 5-30 must be used. In case of direct mounting of the sensor in a through hole, it has to be fixed at the middle of the housing thread.

Installation Conditions

Note

If the sensor is used in an environment with strong electromagnetic interference, we recommend non-conductive mounting. For this, use the accompanying plastic nuts or the BF12 or BF12-F mounting flange.

Please observe proper application when using the accompanying plastic nuts. The hole for the sensor must be ≥ 14 mm.

