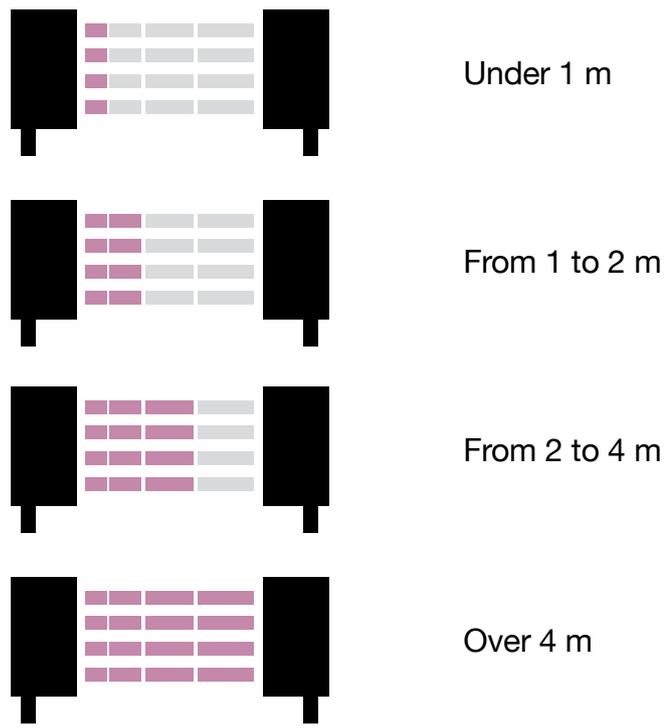


Area Sensors



Nominal sensing distance S_n





Introduction

Optoelectronic scanners are not covered by the provisions of EN 60947-5-2 and the following details only refer to common parameters. The technical terms of the paragraph headings reflect those used in the wording of this legislation, whilst those in italics are synonyms. The specifications listed relate to the nominal performance envisaged by said legislation and apply to products whose technical specifications do not include a specific figure.

Operating principle

Type-T Optoelectronic scanners are made up of two elements; an emitter and a receiver. The emitter has an optical unit that consists of an array of photoemitters which emit a series of narrow luminous pulses to the receiver in a consecutive well-defined manner. Luminous radiation is generated by a solid-state source made up of high-performance long-lasting semiconductor elements. This radiation can be from outside the visible band. The receiver has an optical unit which is made up of an array of photoreceivers which correspond geometrically to those of the emitter. The luminous radiation reaching the photoreceivers is converted to an electric signal, amplified and processed in order to drive receiver output elements. As there is synchronous reading of the luminous pulse, a synchronous signal must be transmitted between emitter/receiver. Detection occurs when the path of the beam is interrupted by the presence of an opaque object.

Parallel-ray scanning

Every pulse emitted by a single element of the emitter array must be synchronously read by the corresponding element of the receiver array so that the single pair can be considered in light state. Every single emitter/receiver pair only controls its own axis of conjunction. Scanning determines an area crossed by parallel rays. Using parallel rays enables precise information to be obtained regarding size and position of target object.

Cross-ray scanning

Every pulse emitted by a single element of the emitter array must be synchronously read by the corresponding element of the receiver array, and by a variable number of other receivers positioned on either side of the central one, so that the single pair can be considered in light state (i.e. path of beam completely clear). Every single emitter/receiver pair controls a range of axes which originate from the emitter and reach an array of receivers. Scanning determines an area crossed by cross rays in a complex manner. The number of lateral receivers involved in reading the single emitter varies according to the range of the particular model. Every emitter must illuminate various receivers and can only do so if the optical-beam angle is sufficient for a certain distance. The number of receivers enabled can also vary during scanning. In extreme cases the two emitters on the edge of the array may only illuminate the internal lateral receivers because the external ones do not exist. Another case in particular is when single emitters must always illuminate all the receivers. This operating mode is simple to manage but requires large beam angles. Operating with cross rays does not enable precise information to be immediately obtained regarding size and position of target object, but merely reveals its presence.

Synchronising scanning

It is the function which allows a single element of the receiver array to be enabled to read only at the moment in which the luminous pulse is sent by the corresponding emitter element. The synchronisation serves to determine a strict relationship between corresponding emitter and receiver so as to reduce the effects of interference from other signals. With type T parallel-ray scanning sensors used for determining size and position of objects, the synchronisation must be realised by connecting a cable between emitter and receiver. With sensors that are only used for detecting the presence of an object, the synchronisation can be sent optically. Usually an emitter is added to the receiver array sends synchronisation message to an additional receiver in the emitter array. Alternatively, timing techniques can be used for autosynchronisation of the receiver, thus eliminating the need for cabling between emitter and receiver. Devices also exist whose arrays of optical elements alternate between emitters and receivers that pass the optical pulses on to each other. This type of solution is another which does not require cable synchronisation and cannot be used for pinpointing position and size of objects.

State of area

To define the state of the area or the single elements, reference must be made to the light/dark condition of the receivers. The dark condition is determined by the presence of an opaque object that blocks the path of the rays. The light condition is on the other hand determined by the fact that the path between emitter and receiver is clear.

General description

The area sensors are composed of two elements: an emitter and a receiver element. The optical part is composed of an array of synchronized photoelements in order to avoid mutual interference. The main characteristics are:

- distance between emitter and receiver (D): it indicates the operating distance between the emitter and the receiver;
- optical beams space (BS): it indicates the spacing that exists between the optical axes of the single elements;
- optical diameter (BD): it indicates the diameter of the output optical lens of the single element;
- optical elements number (BN): it indicates the number of elements that composes the array;
- blind zone (X): it indicates the zones near the emitter and the receiver where the resolution is less than the maximum one. This zone is properly related to the distance (D) between the emitter and the receiver: $X = 0,06 \times D$
- area height (AH): it indicates the height of the area selected by the optical beams: $A_H = [B_S \times (B_N - 1)] + B_D$
- resolution (R): it indicates the minimum dimensions of the target that it is possible to detect: $R = B_S + B_N$
Utilising cross-ray functions the resolution of the minimum detectable target increases (with blind zones exclusion);
- analogical voltage output (VOUT) V it is an available value on the analogical voltage output properly related to the number of occupied / free optics:
NO configuration: $V_{OUT} = (10 / B_N) \times (\text{number of occupied optics})$
NC configuration: $V_{OUT} = (10 / B_N) \times (\text{number of free optics})$
- analogical current-type output (IOUT) V it is an available value on the analogical current-type output properly related to the number of occupied / free optics:
NO configuration: $I_{OUT} = (16 / B_N) \times (\text{number of occupied optics}) + 4$
NC configuration: $I_{OUT} = (16 / B_N) \times (\text{number of free optics}) + 4$

Blanking function

If enabled some rays are turned off. This means that one or more areas are inactive; this can be useful in specific applications.



Area containing multiple horizontal light blue bars, likely representing a list or a series of notes.



BX04 e BX10 series

Medium resolution area sensors



Medium resolution



features

- IP67 protection degree (IP69K special model)
- Complete protection against electrical damages
- Detection of objects with irregular shape
- ATEX models, cat. 2 and cat. 3, available on request
- LED indicators
- Crossed beams detection

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code description

BX04S / 00 - HB

| | | |
|--------------------|-----------|---|
| series | BX | Compact area sensor |
| optics | 04 | 4 optics, 90 mm area height, 30 mm optic step |
| | 10 | 10 optics, 90 mm area height, 10 mm optic step |
| emitter / receiver | S | Emitter with sensitivity adjustment |
| | R | Receiver |
| | SR | Kit emitter + receiver |
| emitter / receiver | 0 | Emitter |
| | X | Emitter with check |
| | A | Receiver NO (Dark ON) |
| emitter / receiver | C | Receiver NO (Light ON) |
| | 0 | Emitter |
| cable exit | D | Receiver NPN + PNP |
| | H | M12 plug cable exit |
| distance | A | Cable exit |
| | B | Sensing distance 0.3 ... 2 m (standard version) |
| version | | Standard version |
| | 6X | Models with 4 m sensing distance |
| | 6A | Models with 6 m sensing distance |
| | 79 | Models with aluminium enclosure and air cooling inlet |
| | DA | Models with glass optic window |
| | 70 | Models with reduced sensing distance 100...350 mm |
| | SY | Models with impulse synchronisation |
| | 9K | Models with IP69K protection |
| | AN | ATEX models 3 GD |
| | AT | ATEX models 2 GD |

BX04
BX10

available models

Medium resolution

| area (mm) | n° of beams | distance (m) | resolution (mm) | model | output | NPN + PNP NO | | NPN + PNP NC | | | | |
|-----------|----------------|--------------|--|----------------|---------|--|---------------|--------------|---------------|---------------|--|---|
| 90 | 4 | 0.3...2 | $\varnothing 35^{(1)}$ $\varnothing 25^{(2)}$ $\varnothing 15^{(3)}$ | emitter | M12 | BX04S/00-HB | | | | | | |
| | | | | | cable | BX04S/00-AB | | | | | | |
| | | | | emitt. + check | M12 | BX04S/X0-HB | | | | | | |
| | | | | | cable | BX04S/X0-AB | | | | | | |
| | | | | receiver | M12 | BX04R/AD-HB | - | | | | | |
| | | | | | cable | BX04R/AD-AB | - | | | | | |
| | | | | 10 | 0.3...4 | $\varnothing 15^{(1)}$ $\varnothing 7.5^{(2)}$ $\varnothing 5^{(3)}$ | emitter | M12 | BX10S/00-HB | | | |
| | | | | | | | | cable | BX10S/00-AB | | | |
| | emitt. + check | M12 | BX10S/X0-HB | | | | | | | | | |
| | | cable | BX10S/X0-AB | | | | | | | | | |
| | receiver | M12 | BX10R/AD-HB | | | | BX10R/CD-HB | | | | | |
| | | cable | BX10R/AD-AB | | | | BX10R/CD-AB | | | | | |
| | 0.3...6 | 0.3...4 | $\varnothing 15^{(1)}$ $\varnothing 7.5^{(2)}$ $\varnothing 5^{(3)}$ | | | | emitter | M12 | BX10S/00-HB6X | | | |
| | | | | | | | | | receiver | BX10R/AD-HB6X | | - |
| | | | | emitter | M12 | BX10S/00-HB6A | | | | | | |
| | | | | | | receiver | BX10R/AD-HB6A | | - | | | |

KIT

| area (mm) | n° of beams | distance (m) | resolution (mm) | model | output | NPN + PNP NO | | | |
|-----------|-------------|--------------|--|--------------------|--------|----------------|--|--|--|
| 90 | 4 | 0.3...2 | $\varnothing 35^{(1)}$ $\varnothing 25^{(2)}$ $\varnothing 15^{(3)}$ | emitter + receiver | M12 | BX04SR/0A-HB | | | |
| | | | | | cable | BX04SR/0A-AB | | | |
| | | | | | M12 | BX04SR/XA-HB | | | |
| | | | | | cable | BX04SR/XA-AB | | | |
| | | | | | M12 | BX10SR/0A-HB | | | |
| | | | | | cable | BX10SR/0A-AB | | | |
| | 10 | 0.3...4 | $\varnothing 15^{(1)}$ $\varnothing 7.5^{(2)}$ $\varnothing 5^{(3)}$ | | M12 | BX10SR/XA-HB | | | |
| | | | | | cable | BX10SR/XA-AB | | | |
| | | | | | M12 | BX10SR/0A-HB6X | | | |
| | | | | | | BX10SR/0A-HB6A | | | |

⁽¹⁾ Guaranteed resolution everywhere in the detection area

⁽²⁾ Guaranteed resolution in the central part of the detection area with exclusion of the dark zones

⁽³⁾ As note (2), but with sensitivity adjustment

⁽⁴⁾ NC output models available on request

Dark zones are parts of the detection area close to the emitter and receiver, their amplitude X is proportional to the distance D between the emitter and the receiver.

BX04 => X = 0,17D

BX10 => X = 0,06D

| | BX04 | BX10 |
|---------------------------------|--|--|
| |  | |
| nominal sensing distance | 0.3...2 m (standard model) 0.3...1.5 m (model DA) 0.3...4 m (model 6X) 0.3...6 m (model 6A) | |
| controlled height | 90 mm | |
| n° of beams | 4 | 10 |
| beams space | 30 mm | 10 mm |
| minimum detectable object | Ø 35 mm ⁽¹⁾ Ø 25 mm ⁽²⁾ Ø 15 mm ⁽³⁾ | Ø 15 mm ⁽¹⁾ Ø 7.5 mm ⁽²⁾ Ø 5 mm ⁽³⁾ |
| emission | infrared | |
| hysteresis | ≤ 10% | |
| supply voltage | 10 ... 26 V cc/dc | |
| ripple | ≤ 10% | |
| no-load supply current | 50 mA (emitter) 25 mA (receiver) | |
| load current | ≤ 100 mA | |
| leakage current | ≤ 10 µA | |
| voltage drop | ≤ 2 V @ IL = 100 mA | |
| output type | NPN + PNP NO or NC | |
| response time (light/dark) | 500 µs (800 µs models 6X and 6A) | |
| response time (dark/light) | 5 ms (8 ms models 6X and 6A) | |
| power on delay | ≤ 85 ms | |
| power supply protections | polarity reversal, transient | |
| output protections | short circuit (autoreset) | |
| sensitivity adjustment | trimmer | |
| operative temperature range | 0 ... +50°C (without freeze) | |
| temperature drift | ≤ 10% | |
| interference to external light | 1000 lux (incandescent lamp) 1500 lux (sunlight) | |
| IP mechanical protection degree | IP67 (IP69K 9K version) | |
| LED indicators | green (emitter) red, yellow (receiver) | |
| housing materials | PBT (PC 9K version) | |
| optic materials | PC | |
| tightening torque | 25 Nm | |
| weight | 230 g connector / 300 g cable | |

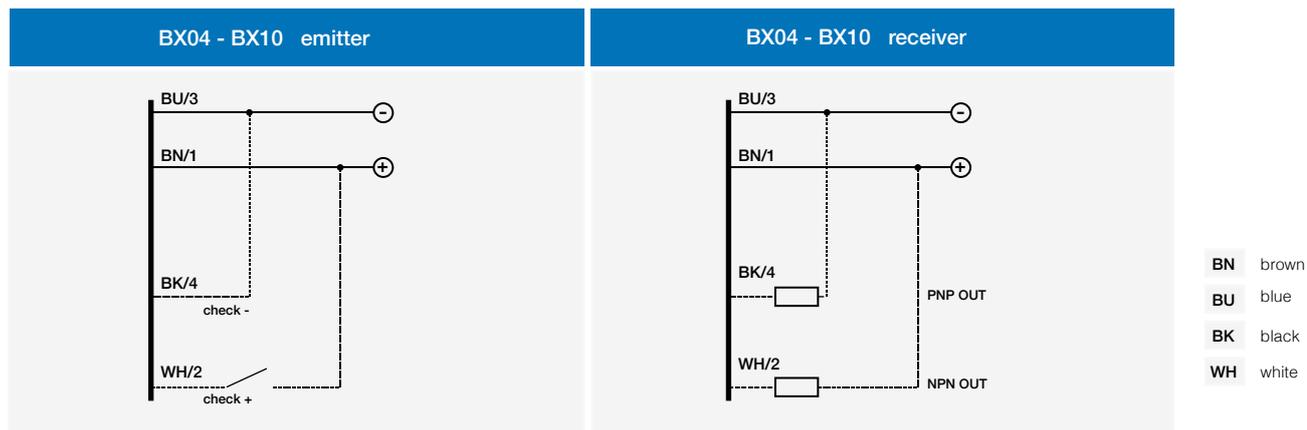
⁽¹⁾ Guaranteed resolution everywhere in the detection area
⁽²⁾ Guaranteed resolution in the central part of the detection area
⁽³⁾ As note (2), but with sensitivity adjustment
⁽⁴⁾ NC output models available on request

Dark zones are parts of the detection area close to the emitter and receiver, their amplitude X is proportional to the distance D between the emitter and the receiver.

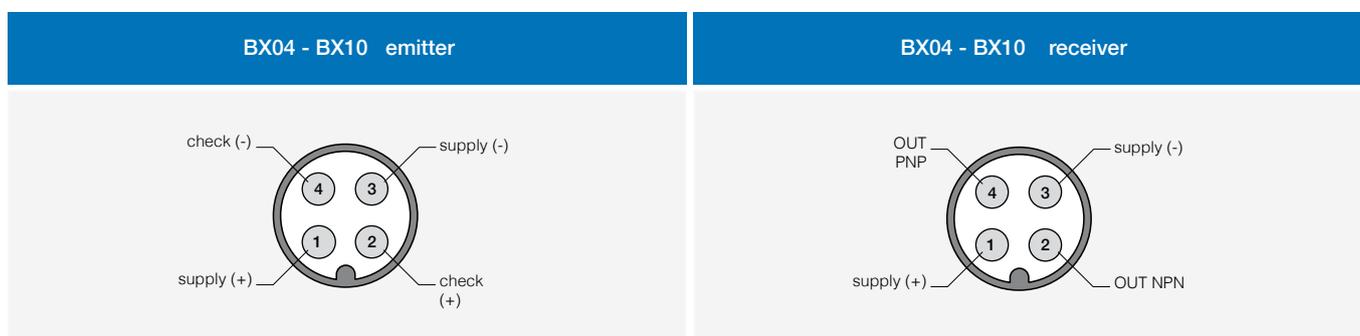
BX04 => X = 0,17D

BX10 => X = 0,06D

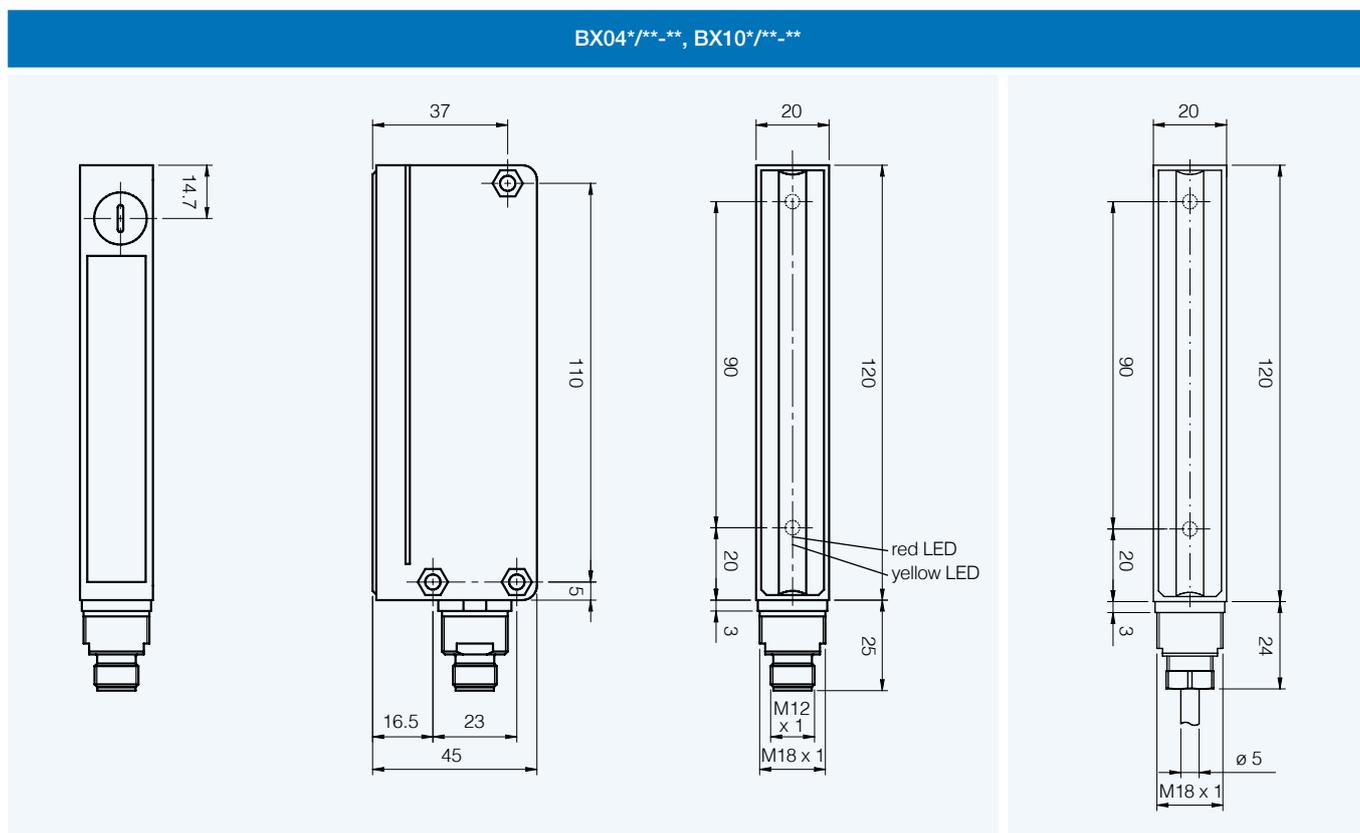
electrical diagrams of the connections



plug

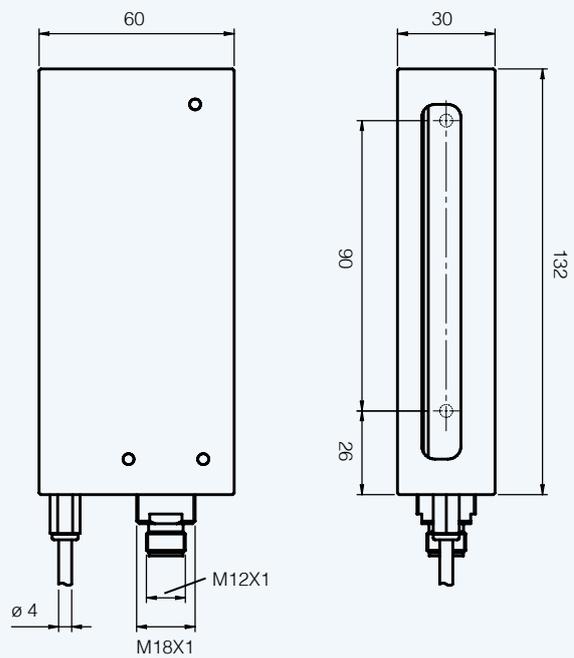


dimensions (mm)

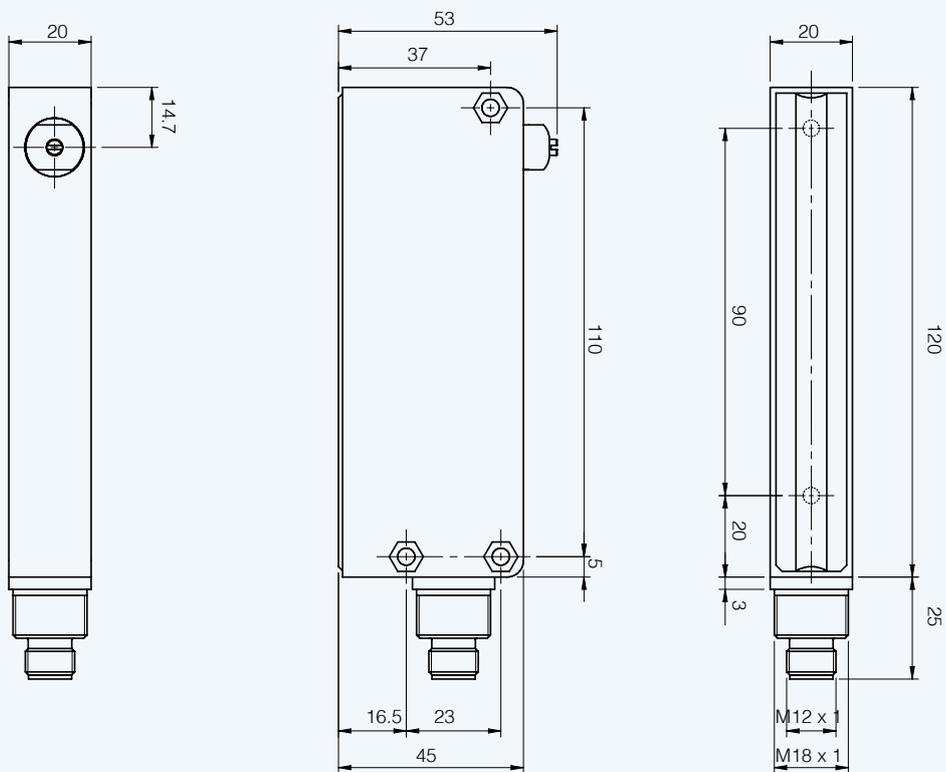




BX10*/**-**79

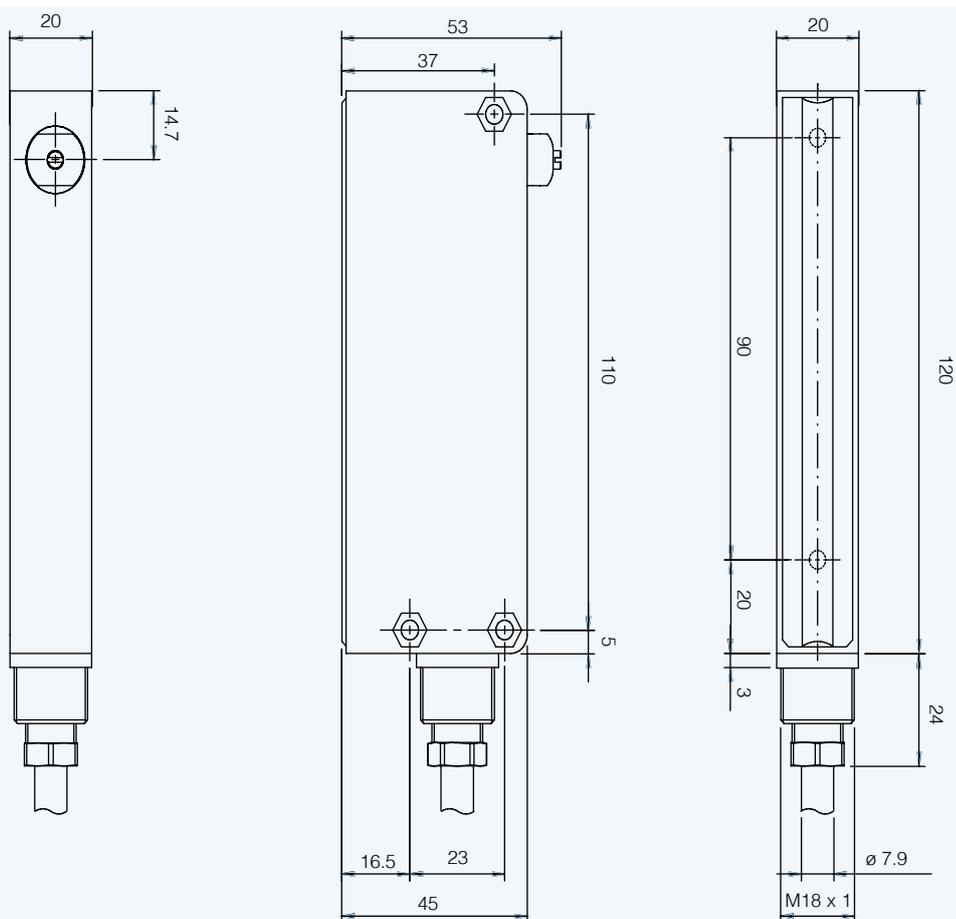


BX04*/**-**9K, BX10*/**-0H9K





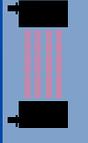
BX04*/**_**AT, BX10*/**_**AT





BX80 series

High resolution cubic housing
area sensor



High resolution
cubic housing



features

- Controlled height 70 mm
- Operating distance up to 2 m
- Microprocessor based circuit
- Sensitivity adjustment
- Strong cubic housing
- Special version with metallic enclosure for high-duty use
- Protection degree IP67
- Complete protection against electrical damages

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code description

BX80 A / 1 P - 0 H

| | | |
|-------------------|-------------|---|
| series | BX80 | High resolution area sensor |
| function | E | Emitter without sensitivity adjustment |
| | S | Emitter with sensitivity adjustment |
| | A | Receiver for object detection with limited crossed beam, logic output, NO/NC selectable |
| | B | Receiver for object detection with extended crossed beam, logic output, NO/NC selectable |
| range | 1 | Range 2 m, resolution \varnothing 5-6 mm, response time 10 ms |
| | 2 | Range 1.5 m, resolution \varnothing 5-6 mm, response time 10 ms |
| | 3 | Range 1 m, resolution \varnothing 5-6 mm, response time 3 ms |
| | 4 | Range 0.6 m, resolution \varnothing 3-6 mm, response time 2 ms |
| | 5 | Range 0.25 m, resolution \varnothing 2 mm, response time 2 ms |
| output | P | PNP output |
| | N | NPN output |
| | 0 | Sender |
| housing | 0 | PBT standard body, with PC optic window |
| | 1 | PBT standard body, with PC optic window + aluminium enclosure with air cooling system |
| | 2 | PBT standard body, with PC glass optic window |
| cable / connector | A | Cable 2 m |
| | H | M12 male connector |
| version | | Standard version |
| | 2D | All logic output receivers, 100 ms delay on dark/light commutation of logic output |
| | 6X | All the codes with 1 position 3, increased reading distance to 2.5 m |
| | 3E | BX80S/50-0H3E, BX80B/0*-0H3E special version for envelopes detection with the follow spec.: operating distance = 200-500 mm; response time = 10 ms; minimum envelope dimension = 1x70 mm |
| | 9K | Models with IP69K protection |
| | AN | ATEX models 3 GD |
| | AT | ATEX models 2 GD |

BX80

available models

High resolution
cubic housing

| PBT standard body with PC optic window | | | | | receiver | |
|--|--------------------|--------------|---------------|---------------|-------------|-------------|
| area (mm) | response time (ms) | distance | distance (mm) | emitter | PNP NO/NC | NPN NO/NC |
| 70 | 10 | 0...2 m | Ø 6 | BX80S/10-0H | BX80A/1P-0H | BX80A/1N-0H |
| | | 0.3...2 m | Ø 5 | | BX80B/1P-0H | BX80B/1N-0H |
| | | 0...1.5 m | Ø 6 | BX80S/20-0H | BX80A/2P-0H | BX80A/2N-0H |
| | | 0.3...1.5 m | Ø 5 | | BX80B/2P-0H | BX80B/2N-0H |
| | 3 | 0...1 m | Ø 6 | BX80S/30-0H | BX80A/3P-0H | - |
| | | 0.5...1 m | Ø 5 | | BX80B/3P-0H | - |
| | 2 | 30...600 mm | Ø 6 | BX80S/40-0H | BX80A/4P-0H | - |
| | | | Ø 3 | | BX80B/4P-0H | - |
| | | 90...250 mm | Ø 2 | BX80S/50-0H | BX80A/5P-0H | - |
| | 10 | 200...500 mm | 1 X 70 | BX80S/50-0H3E | BX80A/5P-0H | - |

| PBT standard body with PC optic window + aluminium enclosure | | | | | receiver | |
|--|--------------------|-------------|-----------------|---------------|---------------|--|
| area (mm) | response time (ms) | distance | resolution (mm) | emitter | PNP NO/NC | |
| 70 | 10 | 0...2 m | Ø 6 | BX80S/10-1H | BX80A/1P-1H | |
| | | 0.3...2 m | Ø 5 | | BX80B/1P-1H | |
| | | 0.3...2.5 m | Ø 5 | BX80S/10-1H6X | BX80B/1P-1H6X | |
| | | 0...1.5 m | Ø 6 | BX80S/20-1H | BX80A/2P-1H | |
| | 0.3...1.5 m | Ø 5 | BX80B/2P-1H | | | |
| | 3 | 0...1 m | Ø 6 | BX80S/30-1H | BX80A/3P-1H | |
| | | 0.5...1 m | Ø 5 | | BX80B/3P-1H | |
| | 2 | 30...600 mm | Ø 6 | BX80S/40-1H | BX80A/4P-1H | |

| PBT standard body, glass optic window | | | | | receiver | |
|---------------------------------------|--------------------|--------------|-----------------|---------------|---------------|--|
| area (mm) | response time (ms) | distance (m) | resolution (mm) | emitter | PNP NO/NC | |
| 70 | 10 | 0...2 | Ø 6 | BX80S/10-2H | BX80A/1P-2H | |
| | | 0.3...2 | Ø 5 | | BX80B/1P-2H | |
| | | 0.3...2.5 | Ø 5 | BX80S/10-2H6X | BX80B/1P-2H6X | |
| | | 0...1.5 | Ø 6 | BX80S/20-2H | BX80A/2P-2H | |
| | 0.3...1.5 | Ø 5 | BX80B/2P-2H | | | |
| | 3 | 0...1 | Ø 6 | BX80S/30-2H | BX80A/3P-2H | |



High resolution
cubic housing

| PBT standard body, glass optic window | | | | | receiver |
|---------------------------------------|--------------------|--------------|-----------------|---------------|-------------|
| area (mm) | response time (ms) | distance | resolution (mm) | emitter | PNP NO/NC |
| 70 | 3 | 0...1 m | Ø 6 | BX80S/30-2H | BX80A/3P-2H |
| | | 0.5...1 m | Ø 5 | | BX80B/3P-2H |
| | 2 | 30...600 mm | Ø 6 | BX80S/40-2H | BX80A/4P-2H |
| | | 90...250 mm | Ø 2 | BX80S/50-2H | BX80A/5P-2H |
| | 10 | 200...500 mm | 1 X 70 | BX80B/50-2H3E | BX80A/5P-2H |

Models with cable exit (2 m): replace H with A in the code (BX80*/**-*H becomes BX80*/**-*A)

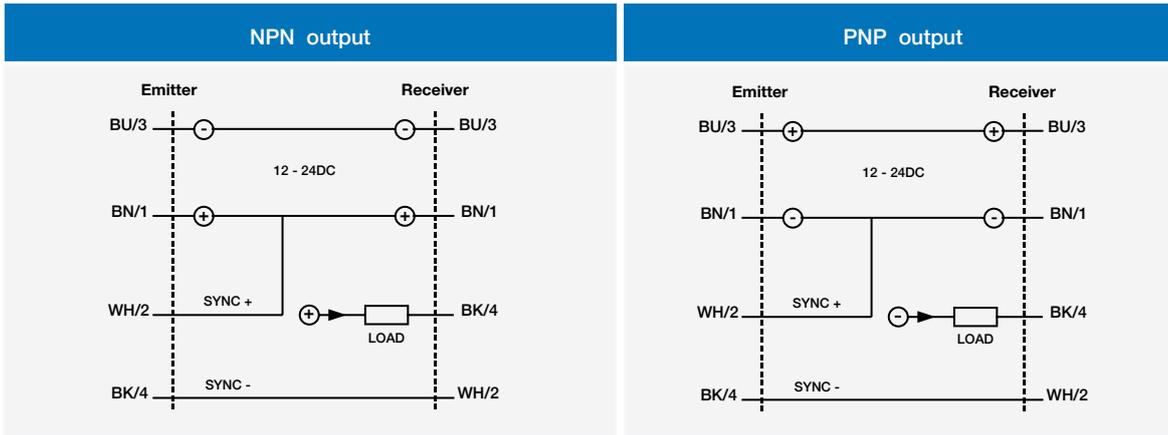
technical specification

| | BX80*/1*-* | BX80*/2*-* | BX80*/3*-* |
|-----------------------------|---|---|---|
| nominal sensing distance |  2 m |  1,5 m |  1 m |
| response time | max. 10 ms | | max. 3 ms |
| controlled height | 70 mm | | |
| n° of beams | 12 | | |
| beam pitch | 6 mm | | |
| minimum detectable object | Ø 6 mm (BX80A/*), Ø 5 mm (BX80B/*) | | |
| minimum operating distance | 0 (BX80A/*), 300 mm (BX80B/1 e BX80B/2), 500 mm (BX80B/3) | | |
| hysteresis | max. 15% | | |
| repeatability | 5 % | | |
| tolerance | 0/20% of the nominal sensing distance Sn | | |
| operating voltage | 12-24 Vcc (standard) | | |
| ripple | 10 % | | |
| no-load supply current | 50 mA (receiver), 100 mA (emitter) | | |
| load current | 100 mA max | | |
| leakage current | 10 µA (at max operating voltage) | | |
| voltage drop | 1.2 V max. (IL = 100 mA) | | |
| output type | NPN or PNP - NO/NC selectable PNP NO/NC selectable | | |
| connection | M12 4 pin connector cable 2 m, M12 5 pin connector cable 2 m (BX80D/*) | | |
| excess gain | 2° (at nominal distance Sn) | | |
| angular displacement | 3° (emitter) - 6° (receiver) at Sn distance | | |
| emission | infrared (880 nm) | | |
| power on delay | 500 ms | | |
| power supply protections | reversal polarity and voltage transient | | |
| output protections | short circuit (auto reset) | | |
| operating temperature range | -25°...+50°C (without freeze) | | |
| storage temperature | -40°...+80°C | | |
| temperature drift | 10% Sr | | |
| external light | 1.500 lux max. (incandescent lamp), 4.500 lux max. (sunlight) | | |
| IP mechanical protection | IP67 (IP69K 9K version) | | |
| emitter LED | green (supply), red (alarm sync.), yellow (area state) | | |
| receiver LED | green (supply), red (alignment), yellow (output state) | | |
| housing material | PBT (PC 9K version) | | |
| lens material | PC | | |
| tightening torque | 25 Nm max. | | |
| wight (approximate) | 260...300 g connector / 800..820 g cable | | |

BX80

| | BX80*/4*~** | BX80*/5*~** |
|-----------------------------|---|---|
| |  |  |
| nominal sensing distance Sn | 0.6 m | 0.25 m |
| response time | max. 2 ms | |
| controlled height | 70 mm | |
| n° of beams | 12 | |
| beam pitch | 6 mm | |
| minimum detectable object | ø 6 mm (BX80A/4), ø 2 mm (BX80B/4), ø 3 mm (BX80D/4) | |
| minimum operating distance | 30 (BX80A/4), 90 mm (BX80B/5), 550 mm (BX80B/4) | |
| hysteresis | max. 15% | |
| repeatability | 5 % | |
| tolerance | 0/20% of the nominal sensing distance Sn | |
| operating voltage | 12-24 Vcc (standard) | |
| ripple | 10 % | |
| no-load supply current | 50 mA (receiver), 100 mA (emitter) | |
| load current | 100 mA max | |
| leakage current | 10 µA (at max operating voltage) | |
| voltage drop | 1.2 V max. (IL = 100 mA) | |
| output type | NPN or PNP- NO/NC selectable | |
| connection | M12 plug 4 pins cable 2 m | |
| excess gain | 2° (at nominal distance Sn) | |
| angular displacement | 3° (emitter) - 6° (receiver) at Sn distance | |
| emission | infrared (880 nm) | |
| power on delay | 500 ms | |
| power supply protections | reversal polarity and voltage transient | |
| output protections | short circuit (auto reset) | |
| operating temperature range | -25°...+50°C (without freeze) | |
| storage temperature | -40°...+80°C | |
| temperature drift | 10% Sr | |
| external light | 1,500 lux max. (incandescent lamp), 4,500 lux max. (sunlight) | |
| IP mechanical protection | IP67 (EN 60529) - IP69K (special models) | |
| emitter LED | green (supply), red (alarm sync.), yellow (area state) | |
| receiver LED | green (supply), red (alignment), yellow (output state) | |
| housing material | PBT (PC 9K version) | |
| lens material | PC | |
| tightening torque | 25 Nm max. | |
| wight (approximate) | 260...300 g connector / 800...820 g cable | |

electrical diagrams of the connections



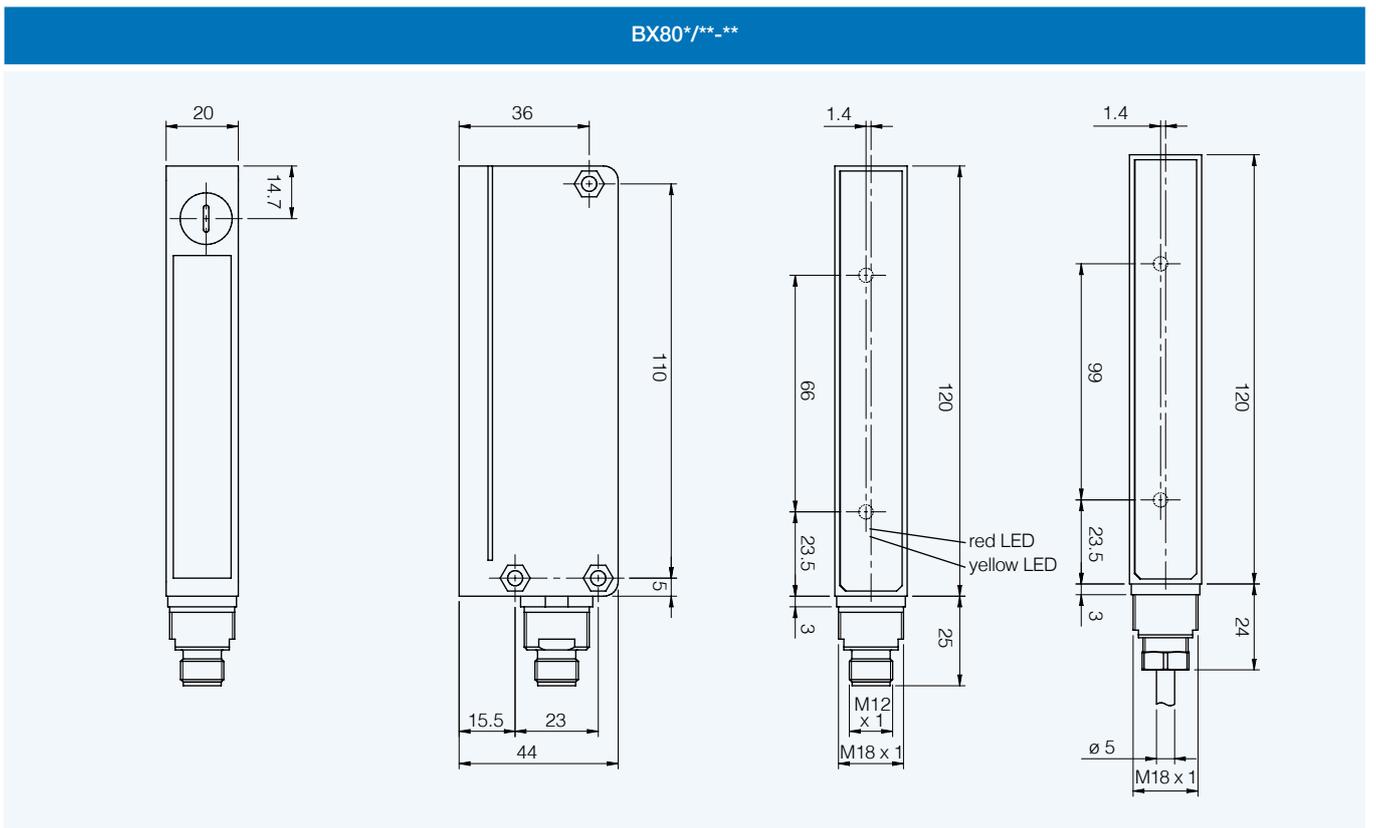
- BN** brown
- BU** blue
- BK** black
- WH** white

Maximum synchronism cable length : 10 m.

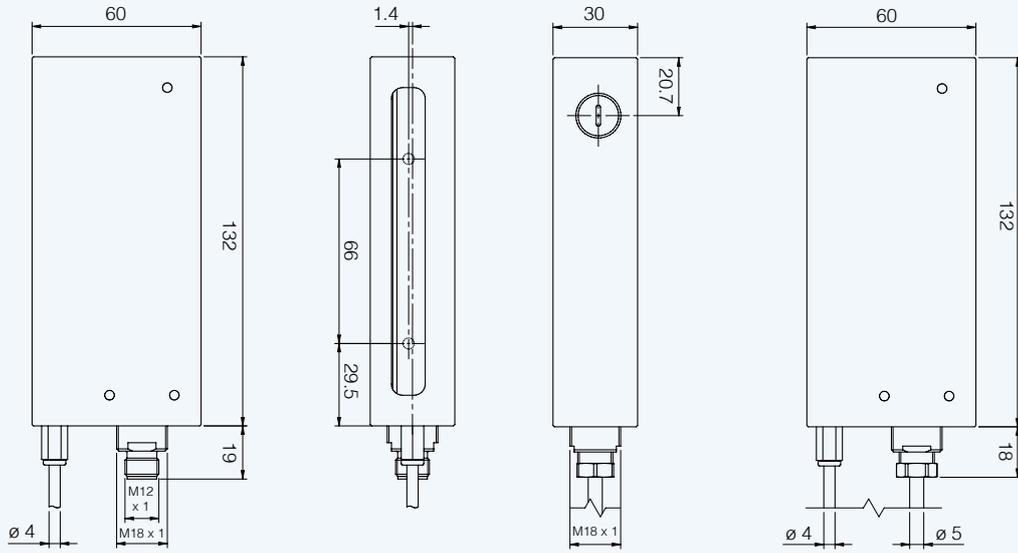
plug



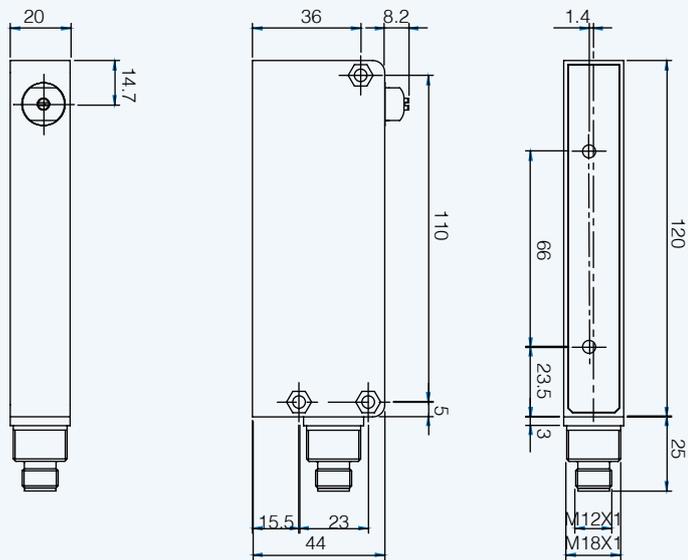
dimensions (mm)



BX80*/**-1H

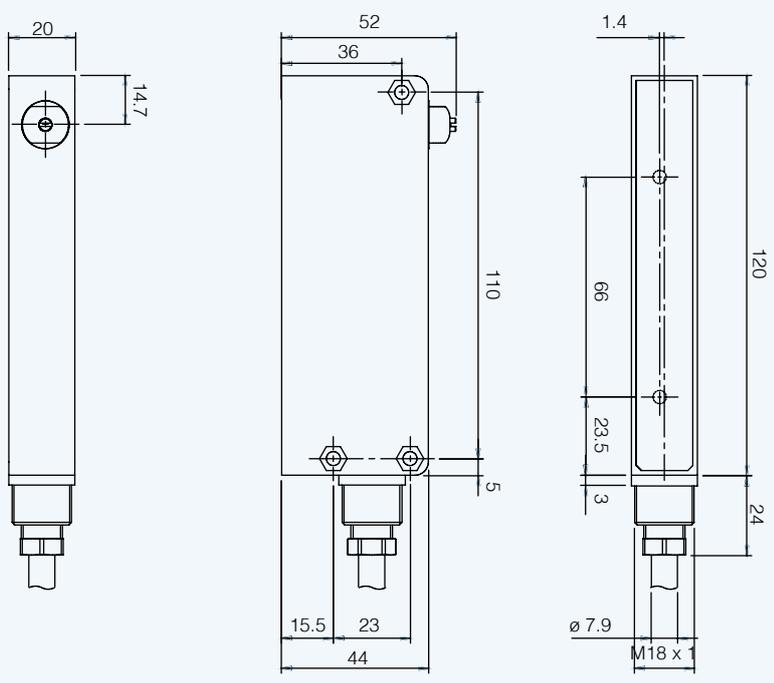


BX80*/**-0H9K





BX80*/**-AT



diagnostics

| LED | state | conditions | check |
|------------------------------|-------------|--|-----------------------------|
| GREEN receiver Supply | stable on | supply is present and stable | - |
| | unstable on | supply is present but not stable | supply |
| | off | no supply or voltage lower than 8Vdc | supply |
| RED receiver Alignment | full on | no alignment | alignment ⁽¹⁾ |
| | light on | partial alignment or short signal | orientamento ⁽¹⁾ |
| | off | correct alignment and sufficient signal | - |
| | blinking on | receiver does not function correctly or output short circuit | wiring or failure |
| YELLOW receiver Supply | on | output in ON state | - |
| | off | output in OFF state | - |
| GREEN emitter Supply | stable on | supply is present and stable | - |
| | unstable on | supply is present but not stable | supply |
| | off | no supply or voltage lower than 8Vdc | supply |
| RED emitter Sync. alam | off | synchronism property received | - |
| | on | synchronism is not received or emitted | wiring or failure |
| YELLOW emitter Area state | on | engaged area or uncorrect alignment | alignment ⁽¹⁾ |
| | off | free area or correct alignment | - |

⁽¹⁾ By free area



notes

Notes area consisting of 25 horizontal light blue lines for writing.



CX0 series

Area sensors with high resolution and compact housing



Area sensor
high resolution

features

- Internal optical synchronization (Teach-In by cable)
- Total crossbeam through all the optics
- Controlled area 160 and 320 mm
- Pitch 5 mm and 10 mm
- Maximum operating distance up to 6 m (for 10 mm pitch) and 3 m (for 5 mm pitch)
- 2 digital NPN and PNP outputs (Teach-In model available only with PNP logic)
NO / NC configurable
- It is possible to detect very thick objects



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- Photos
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code description

| | Code | Description |
|------------------|------|--|
| series | CX0 | Area Sensor cubic section |
| emitter | E | Emitter |
| emitter type | 0 | Emitter with I/O standard configuration |
| | 1 | Emitter with special I/O configuration |
| receiver | R | Receiver |
| receiver type | P | Receiver with PNP output |
| | B | Receiver with two digital outputs (NPN / PNP) |
| pitch | 05 | Pitch 5 mm |
| | 10 | Pitch 10 mm |
| height | 016 | Controlled height 160 mm |
| | 032 | Controlled height 320 mm |
| output | V | Output cable length 220 mm with M12 pigtail |
| special function | | Special Function: emitter and receiver with CX0 common wire and Teach-in emitter |
| | 1 | Emitter and receiver with CX0 common wire and Teach-in emitter |

available models

| OUTPUT | | | INPUT | | | beams number | pitch (mm) | plot (P/I) ⁽³⁾ | working range (m) | detection height (h) | KIT (E + R) ⁽²⁾ | | |
|--------|-----------|--------|----------|------|---------------------------------|--------------|------------|---------------------------|-------------------|----------------------|----------------------------|--------|-----------------|
| state | logic | output | blanking | test | adjustment | | | | | | | | |
| NO/NC | NPN + PNP | 2 | - | • | External Trimmer ⁽¹⁾ | 32 | 5 | I | 0.3...3 | 160 mm | CX0E0RB/05-016V | | |
| | | | | | | 17 | 10 | | 0.5...6 | | CX0E0RB/10-016V | | |
| | | | | | | 32 | 5 | | 1...6 | 320 mm | CX0E0RB/10-032V | | |
| | PNP | 1 | | | - | - | Teach-In | | 32 | 5 | 0.3...3 | 160 mm | CX0E1RP/05-016V |
| | | | | | | | | | 17 | 10 | 0.5...6 | 160 mm | CX0E1RP/10-016V |
| | | | | | | | | | 32 | 10 | 1...6 | 320 mm | CX0E1RP/10-032V |

⁽¹⁾ External trimmer ST 140 sold separately ⁽²⁾ Sales code; single code (emitter or receiver) not available ⁽³⁾ Plot: P = parallel beams, I = crossed beams

available models

Area sensor
high resolution

| OUTPUT | | | INPUT | | | beams number | pitch (mm) | plug (P/I) ⁽³⁾ | working range (m) | detection height (mm) | KIT (E + R) |
|--------|-----------|--------|----------|------|---------------------------------|--------------|------------|---------------------------|-------------------|-----------------------|-----------------|
| state | logic | output | blanking | test | adjustment | | | | | | |
| NO/NC | NPN + PNP | 2 | - | ● | External Trimmer ⁽¹⁾ | 33 | 5 | I | 0.3...3 | 160 | CX1E0RB/05-016V |
| | | | | | | 65 | | P | | 320 | CX1E0RB/05-032V |
| | | | | | | 97 | | | | 480 | CX1E0RB/05-048V |
| | | | | | | 17 | 10 | I | 0.3...6 | 160 | CX1E0RB/10-016V |
| | | | | | | 33 | | | | 320 | CX1E0RB/10-032V |
| | | | | | | 49 | | | | 480 | CX1E0RB/10-048V |
| | | | | | | 65 | | P | | 640 | CX1E0RB/10-064V |
| | | | | | | 81 | | | | 800 | CX1E0RB/10-080V |
| | | | | | | 97 | | | | 960 | CX1E0RB/10-096V |
| | | | | | | | | | | | |

⁽¹⁾ External trimmer ST 140 sold separately ⁽²⁾ Sales code; single code (emitter or receiver) not available ⁽³⁾ Plot: P = parallel beams, I = crossed beams

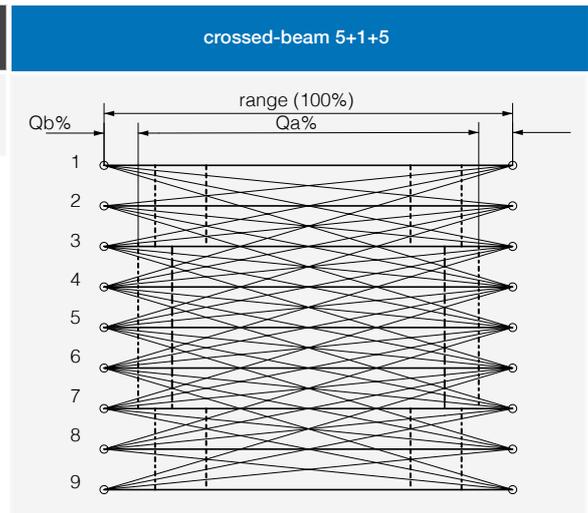
technical specifications

| CX1E*R*/**-*** | |
|------------------------------|---|
| |  |
| nominal sensing distance | 0.3 ... 6 m (beam pitch 10 mm) 0.3... 3 m (beam pitch 5 mm) |
| emission | 850 nm (beam pitch 5mm) 880 nm (beam pitch ≥10mm) |
| operating voltage | 16.8...30 Vdc |
| ripple | < 1.2 Vpp |
| power consumption (receiver) | 1...1.5 W |
| power consumption (emitter) | 1...1.5 W |
| output | 1 x PNP, 1 x NPN |
| output current | < 100 mA |
| output voltage drop | < 1.5 V @ 100 mA |
| minimum load resistance | 280 Ω |
| leakage current | ≤ 10 μA |
| tolerated capacitive load | < 0.7 μF |
| power on delay | 200 ms |
| Teach-In | < 15 s |
| response time | < 17 ms |
| operating temperature | -10°C...55°C |
| storage temperature | -25°C...60°C |
| artificial light rejection | IEC EN 60947-5-2 |
| ambient light rejection | IEC EN 60947-5-2 |
| IP mechanical protection | IP67 |
| humidity | 95% max (no condensation) |
| vibrations | IEC EN 60947-5-2 |
| shocks | IEC EN 60947-5-2 |
| cable length | < 20 m |
| connectors / cables | 1 x M12, 4 poles, male (CX1E), 1 x M12, 5 poles, male (CX1R) |
| housing material | painted aluminium RAL5002 |
| optic materials | PMMA |

CX1

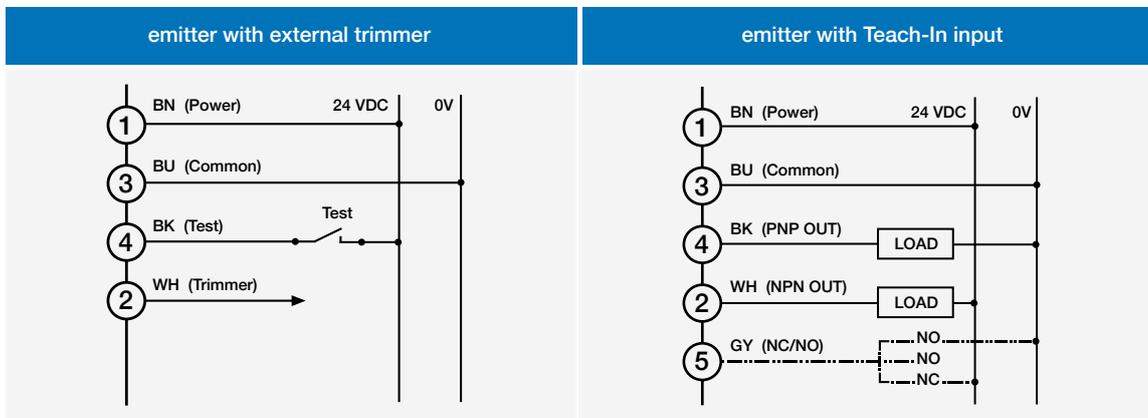
MDO (Minimum Detectable Object)

| beams | step (mm) | resolution ⁽¹⁾ (mm) | qa 17 beams | qa 32 beams |
|------------------------|-----------|--------------------------------|-------------|-------------|
| crossed ⁽²⁾ | 5 | 2,5 | - | 80% |
| | 10 | 5 | 80% | 80% |



⁽¹⁾ = Resolution detected with ST140
⁽²⁾ = The optics cross beam allows detection of objects with a very small diameter or very thin (such as a sheet of paper or an envelope). For those targets with small diameter, the detecting resolution is less effective exactly in the centre between Emitter and Receiver (see Resolution) as well as at the ends of detection area (near to the sensors); the mentioned detection is obtained in the central area Qa with a width equal to a certain % of the distance between the 2 sensors.

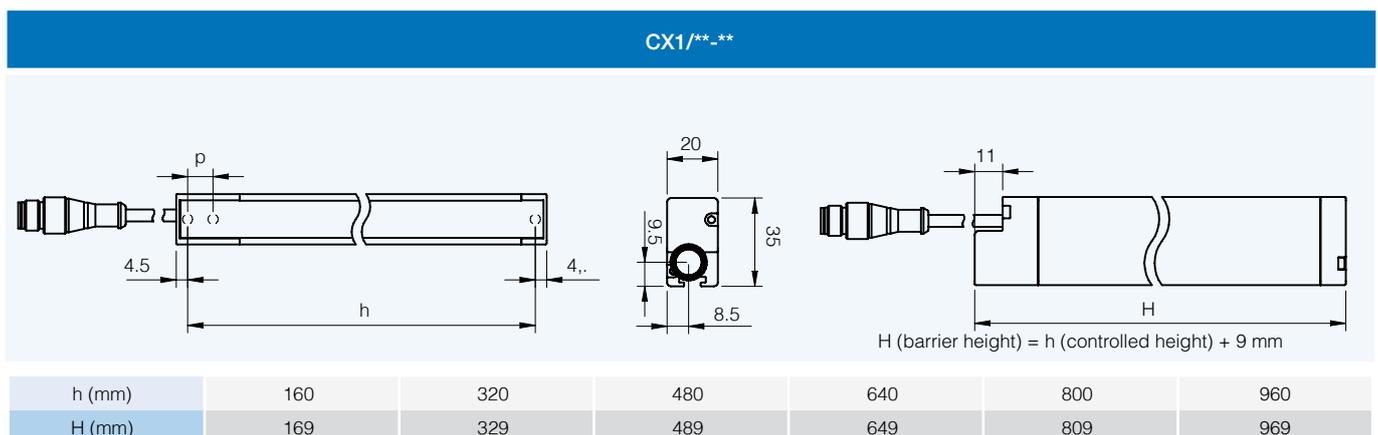
electric diagrams of the connections



plugs



dimensions (mm)

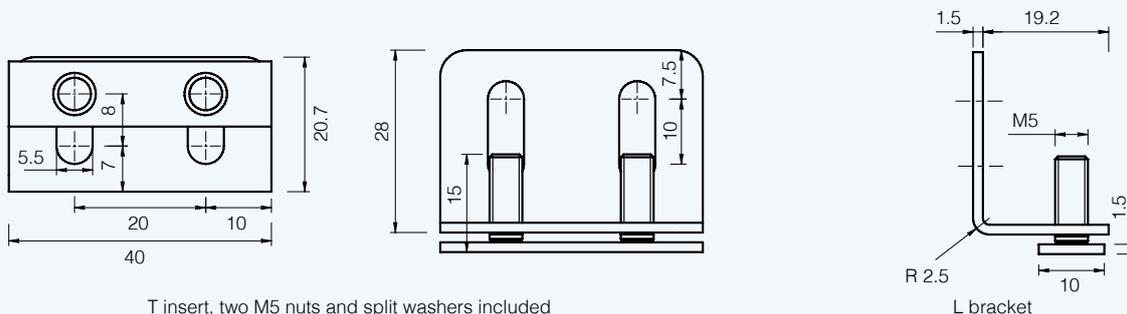


dimensions (mm)

included with all models

Area sensor
high resolution

accessories fixing kit ST151



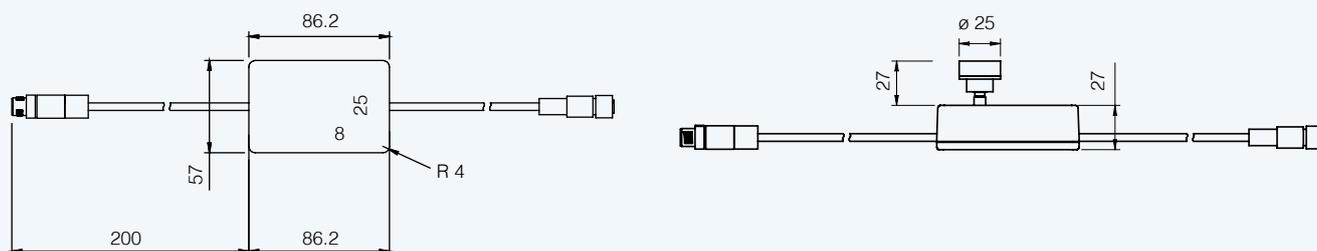
T insert, two M5 nuts and split washers included

| code | description |
|--------|--|
| ST4V S | 4 pcs. kit antivibration basement for barriers with 150 mm protected height |
| ST8V S | 8 pcs. kit antivibration basement for barriers with protected height from 1,500 mm to 1,050 mm |

accessories

not included

accessory for external adjustment ST 140



| code | description |
|----------------|---|
| CD12M/0B-050A1 | power connector M12, 4 wires, female, axial, cable 5 m PVC |
| CD12M/0B-100A1 | power connector M12, 4 wires, female, axial, cable 10 m PVC |
| CD12M/0B-150A1 | power connector M12, 4 wires, female, axial, cable 15 m PVC |
| CD12M/0B-050A5 | power connector M12, 4 wires, female, axial, cable 5 m PUR |
| CD12M/0B-100A5 | power connector M12, 4 wires, female, axial, cable 10 m PUR |
| CD12M/0B-150A5 | power connector M12, 4 wires, female, axial, cable 15 m PUR |
| CD12M/0H-050A5 | power connector M12, 5 wires, female, axial, cable 5 m PUR |
| CD12M/0H-100A5 | power connector M12, 5 wires, female, axial, cable 10 m PUR |
| CD12M/0H-150A5 | power connector M12, 5 wires, female, axial, cable 15 m PUR |

CX1



CX1 series

Area sensors with high resolution and compact housing with digital output



Area sensor
high resolution

features

- optical synchronization
- floating crossbeam with fixed amplitude (5 + 1 + 5)
- area height controlled from 160 and 320 mm
- pitch 5 mm and 10 mm
- maximum operating distance up to 6 m (for 10 mm pitch) and 3 m (for 5 mm pitch)
- NPN and PNP digital outputs NO / NC configurable
- for a correct use it is necessary to manually adjust the emitter (accessory ST 140)



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code description

| | CX1 | E | 0 | R | B | / | 05 | - | 016 | V |
|---------------|-----|---|---|---|---|---|----|---|-----|---|
| series | CX1 | Area Sensor cubic section | | | | | | | | |
| emitter | E | Emitter | | | | | | | | |
| emitter type | 0 | Emitter with I/O standard configuration | | | | | | | | |
| receiver | R | Receiver | | | | | | | | |
| receiver type | B | Receiver with two digital outputs (NPN / PNP) | | | | | | | | |
| pitch | 05 | Pitch 5 mm | | | | | | | | |
| | 10 | Pitch 10 mm | | | | | | | | |
| height | 016 | Controlled height 160 mm | | | | | | | | |
| | 032 | Controlled height 320 mm | | | | | | | | |
| | 048 | Controlled height 480 mm | | | | | | | | |
| | 064 | Controlled height 640 mm | | | | | | | | |
| | 080 | Controlled height 800 mm | | | | | | | | |
| output | 096 | Controlled height 960 mm | | | | | | | | |
| | V | Output cable length 220 mm with M12 pigtail | | | | | | | | |

available models

Area sensor
high resolution

| OUTPUT | | | INPUT | | | beams number | pitch (mm) | plot (P/I) ⁽¹⁾ | working range (m) | detection height | KIT (E + R) | | | | | | |
|--------|-----------|-----------------------------|----------|---------|------------|-----------------|---|---------------------------|-------------------|------------------|-----------------|----|---|--------|---------|-----------------|-----------------|
| state | logic | output | blanking | test | adjustment | | | | | | | | | | | | |
| NO/NC | NPN + PNP | | | | | 33 | 5 | I/P | 0.3...3 | 160 mm | CX2E0RB/05-016V | | | | | | |
| | | | | | | 65 | | P | | 320 mm | CX2E0RB/05-032V | | | | | | |
| | | | | | | 97 | | | | 480 mm | CX2E0RB/05-048V | | | | | | |
| | | | | | | 17 | 10 | I/P | 0.3...6 | 160 mm | CX2E0RB/10-016V | | | | | | |
| | | | | | | 33 | | | | 320 mm | CX2E0RB/10-032V | | | | | | |
| | | | | | | 49 | | | | 480 mm | CX2E0RB/10-048V | | | | | | |
| | | | | | | 65 | | | | 640 mm | CX2E0RB/10-064V | | | | | | |
| | | | | | | 81 | | | | 800 mm | CX2E0RB/10-080V | | | | | | |
| | | | | | | 97 | | | | 960 mm | CX2E0RB/10-096V | | | | | | |
| | | | | | | 9 | 20 | P | 0.3...6 | 160 mm | CX2E0RB/20-016V | | | | | | |
| | | | | | | 17 | | | | 320 mm | CX2E0RB/20-032V | | | | | | |
| | | | | | | 25 | | | | 480 mm | CX2E0RB/20-048V | | | | | | |
| | | | | | | 33 | | | | 640 mm | CX2E0RB/20-064V | | | | | | |
| | | | | | | 41 | | | | 800 mm | CX2E0RB/20-080V | | | | | | |
| | | | | | | 49 | | | | 960 mm | CX2E0RB/20-096V | | | | | | |
| | | | | | | 33 | analog voltage output + analog current output | 2 | ● | ● | Teach-In | 33 | 5 | P | 0.3...3 | 160 mm | CX2E0RA/05-016V |
| | | | | | | 65 | | | | | | P | | | | 320 mm | CX2E0RA/05-032V |
| | | | | | | 97 | | | | | | | | | | 480 mm | CX2E0RA/05-048V |
| | 17 | 10 | P | 0.3...6 | 160 mm | CX2E0RA/10-016V | | | | | | | | | | | |
| | 33 | | | | 320 mm | CX2E0RA/10-032V | | | | | | | | | | | |
| | 49 | | | | 480 mm | CX2E0RA/10-048V | | | | | | | | | | | |
| | 65 | | | | 640 mm | CX2E0RA/10-064V | | | | | | | | | | | |
| | 81 | | | | 800 mm | CX2E0RA/10-080V | | | | | | | | | | | |
| | 97 | | | | 960 mm | CX2E0RA/10-096V | | | | | | | | | | | |
| | 9 | 20 | P | 0.3...6 | 160 mm | CX2E0RA/20-016V | | | | | | | | | | | |
| | 17 | | | | 320 mm | CX2E0RA/20-032V | | | | | | | | | | | |
| | 25 | | | | 480 mm | CX2E0RA/20-048V | | | | | | | | | | | |
| | 33 | | | | 640 mm | CX2E0RA/20-064V | | | | | | | | | | | |
| | 41 | | | | 800 mm | CX2E0RA/20-080V | | | | | | | | | | | |
| | 49 | | | | 960 mm | CX2E0RA/20-096V | | | | | | | | | | | |
| | 33 | PNP + analog voltage output | | | | | | | | | | 33 | 5 | I/P | 0.3...3 | 160 mm | CX2E0RF/05-016V |
| | 65 | | | | | | | | | | | P | | 320 mm | | CX2E0RF/05-032V | |
| | 97 | | | | | | | | | | | | | 480 mm | | CX2E0RF/05-048V | |
| | 17 | | | | | | 10 | I/P | 0.3...6 | 160 mm | CX2E0RF/10-016V | | | | | | |
| | 33 | | | | | | | | | 320 mm | CX2E0RF/10-032V | | | | | | |
| | 49 | | | | | | | | | 480 mm | CX2E0RF/10-048V | | | | | | |
| 65 | 640 mm | | | | | | | | | CX2E0RF/10-064V | | | | | | | |
| 81 | 800 mm | | | | | | | | | CX2E0RF/10-080V | | | | | | | |
| 97 | 960 mm | | | | | | | | | CX2E0RF/10-096V | | | | | | | |
| 9 | 20 | | | | | | P | 0.3...6 | 160 mm | CX2E0RF/20-016V | | | | | | | |
| 17 | | | | | | | | | 320 mm | CX2E0RF/20-032V | | | | | | | |
| 25 | | | | | | | | | 480 mm | CX2E0RF/20-048V | | | | | | | |
| 33 | | | | | | | | | 640 mm | CX2E0RF/20-064V | | | | | | | |
| 41 | | | | | | | | | 800 mm | CX2E0RF/20-080V | | | | | | | |
| 49 | | | | | | | | | 960 mm | CX2E0RF/20-096V | | | | | | | |

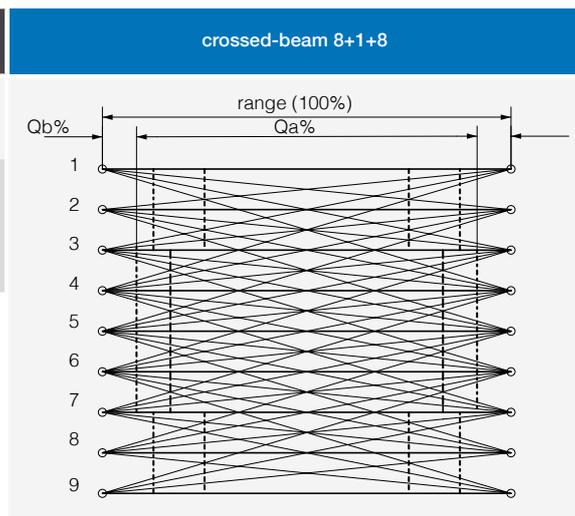
⁽¹⁾Plot: P = parallel beams, I = crossed beams

| CX2E*R*/**_***V | |
|------------------------------|---|
| | |
| nominal sensing distance | 0.1 ... 3 m (beam pitch 5 mm) 0.3 ... 6 m (beam pitch 10 mm) |
| emission | 850 nm (beam pitch 5mm) 880 nm (beam pitch ≥10mm) |
| operating voltage | 16.8...30 Vdc |
| ripple | < 1.2 Vpp |
| power consumption (receiver) | 1...2.5 W |
| power consumption (emitter) | 1...3 W |
| output | 1 x PNP, 1 x NPN (CX2E0RB); 1 x analog voltage output, 1 x analog current output (CX2E0RA); 1 x PNP, 1 X analog voltage output (CX2E0RF) |
| output current | < 100 mA |
| output voltage drop | < 1.5 V @ 100 mA |
| minimum load resistance | 280 Ω |
| leakage current | ≤ 10 μA |
| tolerated capacitive load | < 0.7 μF |
| power on delay | < 3 sec ⁽¹⁾ |
| Teach-In | (0.5 x N beams) sec |
| response time | ((0.2 x (N beams - 1)) + 1) x 2 ms |
| operating temperature | -10°C...55°C |
| storage temperature | -25°C...60°C |
| artificial light rejection | IEC EN 60947-5-2 |
| ambient light rejection | IEC EN 60947-5-2 |
| IP mechanical protection | IP67 |
| humidity | 95% max (no condensation) |
| vibrations | IEC EN 60947-5-2 |
| shocks | IEC EN 60947-5-2 |
| cable length | < 20 m |
| connectors / cables | 1 x M12, 4 poles, male (CX2E), 1 x M12, 8 poles, male (CX2R) |
| housing material | alluminio verniciato RAL5002 |
| optic materials | PMMA |

⁽¹⁾ Power on delay with blanking function: (1 x N beams) sec

MDO (Minimum Detectable Object)

| beams | step (mm) | resolution ⁽¹⁾ (mm) | qa 17 beams | qa 32 beams |
|------------------------|-----------|--------------------------------|-------------|-------------|
| crossed ⁽²⁾ | 5 | 2,5 | - | 93% |
| | 10 | 5 | 93% | |
| parallel | 5 | 5 | - | - |
| | 10 | 10 | | |
| | 20 | 20 | | |



⁽¹⁾ = resolution detected with Teach Gross

⁽²⁾ = the optics cross beam allows detection of objects with a very small diameter or very thin (such as a sheet of paper or an envelope). For those targets with small diameter, the detecting resolution is less effective exactly in the centre between Emitter and Receiver (see Resolution) as well as at the ends of detection area (near to the sensors); the mentioned detection is obtained in the central area Qa with a width equal to a certain % of the distance between the 2 sensors.

plugs

| | |
|---|---|
| CX2E0/**_**_** emitter with test input | CX2RB/**_**_** receiver with PNP and NPN output |
| | |
| CX2RA/**_**_** receiver with analog output | CX2RF/**_**_** receiver PNP with analog output V |
| | |

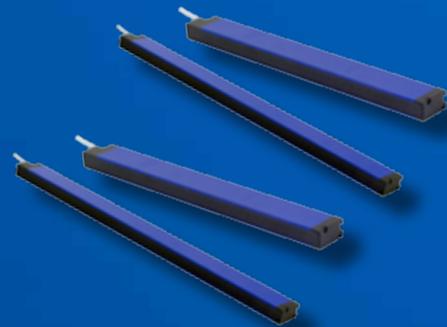


CX2 series

Area sensors with high resolution and compact housing with digital and analogue output



Area sensor
high resolution



features

- synchronization by cable
- parallel beams and floating crossbeams with variable amplitude
- controlled area from 160 and 320 mm
- pitch 5 mm and 10 mm
- maximum operating distance up to 6 m
- double NPN and PNP digital outputs, NO / NC configurable
- 2 analogue outputs: Current and Voltage
- blanking function available

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code description

| | CX2 | E | 0 | R | B | / | 05 | - | 016 | V | |
|------------------|-----|---|---|---|---|---|----|---|-----|---|--|
| series | CX2 | Area Sensor cubic section | | | | | | | | | |
| emitter | E | Emitter | | | | | | | | | |
| emitter type | 0 | Emitter with I/O standard configuration | | | | | | | | | |
| receiver | R | Receiver | | | | | | | | | |
| receiver type | A | Receiver with two analogue outputs (voltage 0...10 V and current 4...20 mA) | | | | | | | | | |
| | B | Receiver with two digital outputs (NPN and PNP) | | | | | | | | | |
| | F | Receiver with one digital output PNP and one analogue output (voltage 0...10 V) | | | | | | | | | |
| pitch | 05 | Pitch 5 mm | | | | | | | | | |
| | 10 | Pitch 10 mm | | | | | | | | | |
| | 20 | Pitch 20 mm | | | | | | | | | |
| height | 016 | Controlled height 160 mm | | | | | | | | | |
| | 032 | Controlled height 320 mm | | | | | | | | | |
| | 048 | Controlled height 480 mm | | | | | | | | | |
| | 064 | Controlled height 640 mm | | | | | | | | | |
| | 080 | Controlled height 800 mm | | | | | | | | | |
| output | 096 | Controlled height 960 mm | | | | | | | | | |
| | V | Output cable length 220 mm with M12 pigtail | | | | | | | | | |
| special function | TP | Analog reading last led TOP BEAM (CX2RA) | | | | | | | | | |

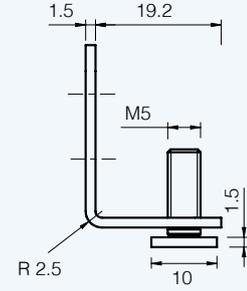
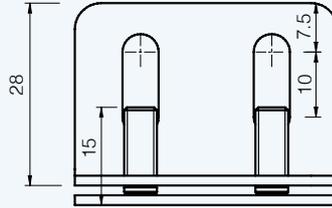
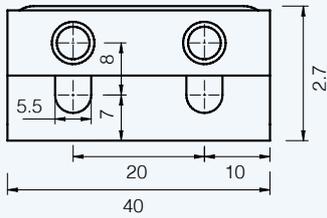


accessories

included with all models

Area sensor
high resolution

accessories fixing kit ST151



T insert, two M5 nuts and split washers included

L bracket

| code | description |
|--------|--|
| ST4V S | 4 pcs. kit antivibration basement for barriers with 150 mm protected height |
| ST8V S | 8 pcs. kit antivibration basement for barriers with protected height from 1,500 mm to 1,050 mm |



accessories

not included

| code | description |
|----------------|---|
| CD12M/0B-050A1 | power connector M12, 4 wires, female, axial, cable 5 m PVC |
| CD12M/0B-100A1 | power connector M12, 4 wires, female, axial, cable 10 m PVC |
| CD12M/0B-150A1 | power connector M12, 4 wires, female, axial, cable 15 m PVC |
| CD12M/0B-050A5 | power connector M12, 4 wires, female, axial, cable 5 m PUR |
| CD12M/0B-100A5 | power connector M12, 4 wires, female, axial, cable 10 m PUR |
| CD12M/0B-150A5 | power connector M12, 4 wires, female, axial, cable 15 m PUR |
| CD12M/0X-050A5 | power connector M12, 8 wires, female, axial, cable 5 m PUR |
| CD12M/0X-100A5 | power connector M12, 8 wires, female, axial, cable 10 m PUR |
| CD12M/0X-150A5 | power connector M12, 8 wires, female, axial, cable 15 m PUR |

| CX2E*R*/**_***V | |
|------------------------------|---|
| |  |
| nominal sensing distance | 0.1 ... 3 m (beam pitch 5 mm) 0.3 ... 6 m (beam pitch 10 mm) |
| emission | 850 nm (beam pitch 5mm) 880 nm (beam pitch ≥10mm) |
| operating voltage | 16.8...30 Vdc |
| ripple | < 1.2 Vpp |
| power consumption (receiver) | 1...2.5 W |
| power consumption (emitter) | 1...3 W |
| output | 1 x PNP, 1 x NPN (CX2E0RB); 1 x analog voltage output, 1 x analog current output (CX2E0RA); 1 x PNP, 1 X analog voltage output (CX2E0RF) |
| output current | < 100 mA |
| output voltage drop | < 1.5 V @ 100 mA |
| minimum load resistance | 280 Ω |
| leakage current | ≤ 10 μA |
| tolerated capacitive load | < 0.7 μF |
| power on delay | < 3 sec ⁽¹⁾ |
| Teach-In | (0.5 x N beams) sec |
| response time | ((0.2 x (N beams - 1)) + 1) x 2 ms |
| operating temperature | -10°C...55°C |
| storage temperature | -25°C...60°C |
| artificial light rejection | IEC EN 60947-5-2 |
| ambient light rejection | IEC EN 60947-5-2 |
| IP mechanical protection | IP67 |
| humidity | 95% max (no condensation) |
| vibrations | IEC EN 60947-5-2 |
| shocks | IEC EN 60947-5-2 |
| cable length | < 20 m |
| connectors / cables | 1 x M12, 4 poles, male (CX2E), 1 x M12, 8 poles, male (CX2R) |
| housing material | painted aluminium RAL5002 |
| optic materials | PMMA |

⁽¹⁾ Power on delay with blanking function: (1 x N beams) sec

available models

Special Area Sensors

| function | optics | adjust. | check | output | moisture resistant | delay (ms) | distance (m) | model | |
|--------------------|----------------|---------|-------|----------|--------------------|------------|--------------|-----------------|-----------------|
| emitter + receiver | 14 axial | ● | ● | NPN - NO | | 100 | 0,37...2 | NX14SR/XAN-A010 | |
| | | | | | | | | | NX14SR/XAP-A000 |
| | 14 right angle | | | PNP - NO | - | - | | NX14SR/XAP-C000 | |
| | | | | | | | | | NX14SR/XAP-C010 |
| | 14 axial | | | | ● | 100 | | NX14SR/XCN-AT10 | |
| | 14 right angle | | | NPN - NC | - | ● | | NX14SR/XCN-C010 | |
| | | | | | | | | | NX14SR/XCN-CT10 |
| | 16 axial | | | PNP - NC | | - | | NX14SR/XCP-C000 | |
| | 16 right angle | | | | | | | | NX16SR/XAN-A010 |
| | | | | | | | | | NX16SR/XAN-C000 |
| | 16 axial | | | NPN - NO | | - | | NX16SR/XAN-C010 | |
| | 16 right angle | | | | ● | | | NX16SR/XAN-CT10 | |
| | | | | | | | | | NX16SR/XAP-A010 |
| | 16 axial | | | PNP - NO | | - | | NX16SR/XAN-C010 | |
| | 16 right angle | | | | | | | | NX16SR/XCN-A010 |
| | | | | | | | | | NX16SR/XCN-AT10 |
| | | | | | NX16SR/XCN-C010 | | | | |
| | | | | | NX16SR/XCN-CT10 | | | | |

| NX**SR/***_***** | |
|--------------------------------|---|
| |  |
| type | medium resolution area sensor with 16/14 optics, step 10 mm |
| nominal sensing distance | 0.37...2 m 880 nm (beam pitch ≥10mm) |
| emission | infrared (880 nm), modulated |
| controlled height | 150 mm (16 optics) ; 132 mm (14 optics) |
| minimum sensing distance | 370 mm |
| minimum detectable object | ∅15 ⁽¹⁾ / ∅ 7.5 ⁽²⁾ / ∅ 5 ⁽³⁾ mm |
| hysteresis | < 10% |
| supply voltage | 10 – 26 Vdc |
| ripple | 10% |
| no-load supply current | 150 mA (emitter) – 25 mA (receiver) |
| output current | 100 mA |
| leakage current | < 10 µA (a Vdc max.) |
| voltage drop | 2 V a 100 mA |
| output type | NPN or PNP open collector, NO or NC |
| input | check input |
| response time (Light/Dark) | 500 µsec |
| response time (Light/Dark) | 7 ms |
| power on delay | < 85 ms (switch on delay) |
| output delay | 100 ms (according to models) |
| power supply protections | polarity reversal - transient |
| output protection | short circuit (autoreset) |
| temperature range | -0 /+ 55 °C (without freeze) |
| interference to external light | 1000 lux (incandescent lamp) 1500 lux (sunlight) |
| IP mechanical protection | not defined |
| emitter LED | yellow (supply and emission active) |
| receiver LED | red (signal level) – Yellow (output state active) |
| housing material | No housing. Mechanical and electrical protections of the PCB have to be submitted to the machine structure |
| connections | With PCB connectors / Emitter, Conn. 3 MOLEX 22-05-7038 - Positive, Check, Common / Receiver, Conn. 1 MOLEX 22-05-7038 - Positive, Check, Common / Receiver, Conn. 2 MOLEX 22-05-7048 Positive, Check, Output, Common |
| dimensions | 157 x 36 x 18 mm (16 optics) - 140 x 36 x 18 mm (14 optics) |
| weight (approximate) | 104 g |

⁽¹⁾ Guaranteed resolution everywhere in the detection area

⁽²⁾ Guaranteed resolution in the central part of the detection

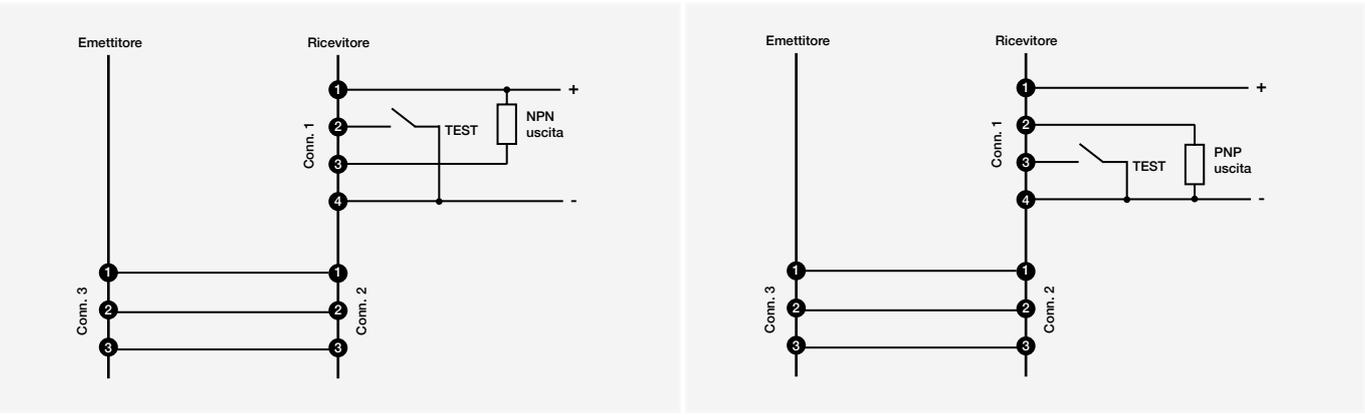
⁽³⁾ As note (2), but with sensivity adjustment

Dark zones are parts of the detection area close to the emitter and receiver, their amplitude X is proportional to the distance D between the emitter and the receiver. X=0.06D.



electrical diagrams of the connections

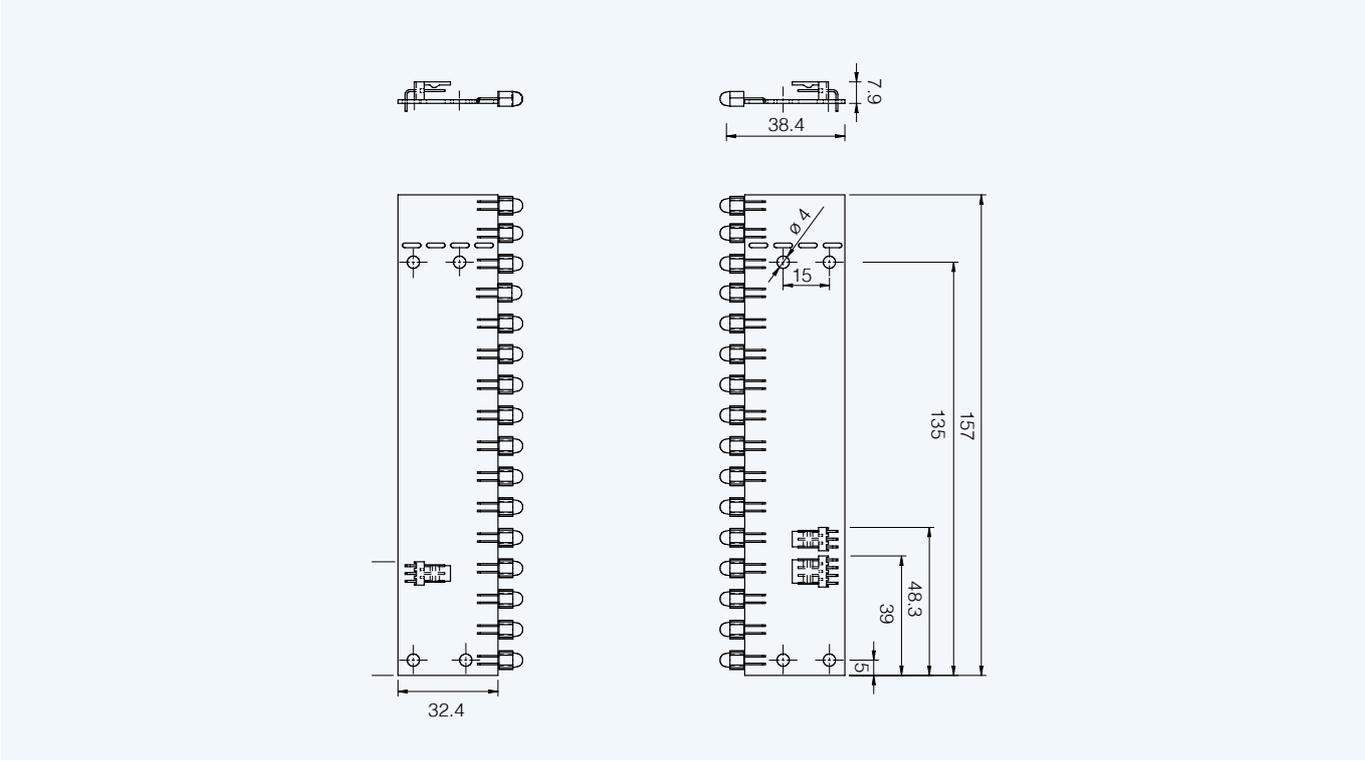
NPN output PNP output



- Warnings regarding to electrostatic discharge (ESD)
- disconnect the supply voltage before touching the device
 - discharge the electrostatic charges before touching the device
 - use metallic screws to install the device

dimensions (mm)

NX16SR/***_A***



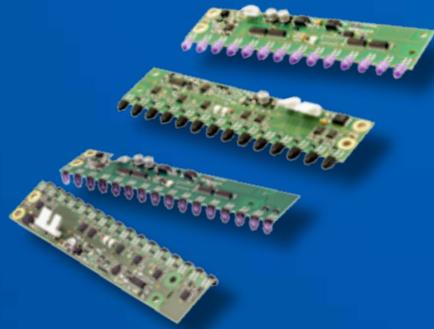


NX series

Medium resolution area sensors
without housing



Special Area Sensors



features

- Complete protection against electrical damages
- LED indicators
- Crossed beams detection
- Without housing
- 16 or 14 optics
- Detection of goods in automatic vending machines
- Detection of objects with irregular shape

web contents



- Application notes
- Photos
- Catalogue / Manuals

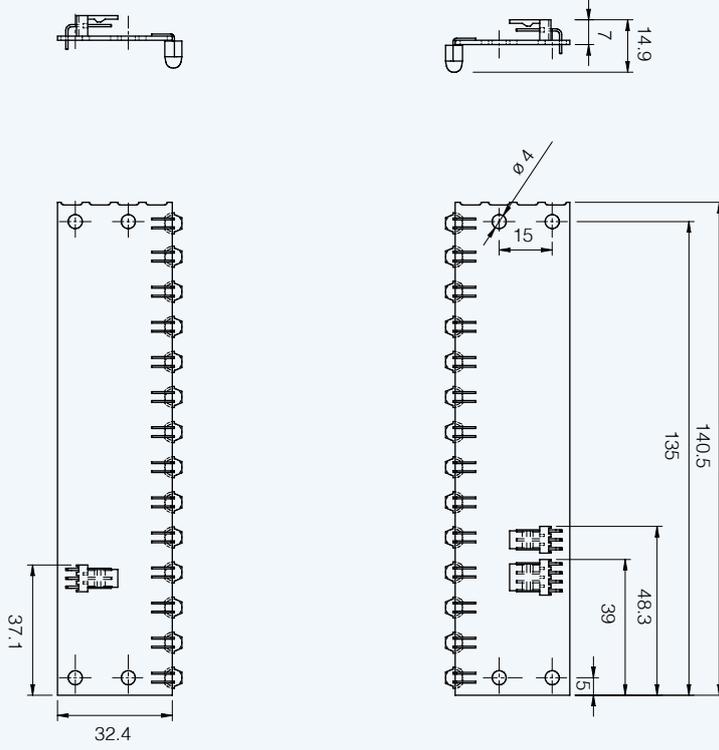
code description

NX 16SR / X A N - A 0 00

| | | |
|--------------------|-----------|-------------------------------------|
| series | NX | Area sensor without housing |
| optics | 16 | 16 optics (150 mm area height) |
| | 14 | 14 optics (132 mm area height) |
| emitter / receiver | S | Emitter with sensitivity adjustment |
| | R | Receiver |
| | SR | Emitter + receiver kit |
| emitter / receiver | 0 | Emitter without check |
| | X | Emitter with check |
| | R | Receiver |
| output | 0 | Emitter |
| | A | NO output |
| | C | NC output |
| output | 0 | Emitter |
| | P | PNP output |
| | N | NPN output |
| optics | A | Axial optics |
| | C | Right angle optics |
| model | 0 | Standard model |
| | T | Moisture resistant model |
| output | 00 | Output without delay off |
| | 10 | 100 ms output delay off |



NX14SR/***_A***





A series of 20 horizontal light blue bars, evenly spaced, intended for writing notes.

