# Contents

# 2 - Inductive proximity sensors

## Osiprox® Application (continued)



## Osiprox® Universal, Optimum and Application

# Proximity sensors
## Inductive proximity sensors
## Osiprox® Universal



| Case | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Cylindrical | | | | | | |
| | | Ø 8 | Ø 12 | Ø 18 | Ø 30 | Ø 12 | Ø 18 | Ø 30 |
| | | Standard range | | | | Increased range | | |
| | |  | | | | | | |
| **Flush mountability** | | Flush mountable | | | | Non flush mountable | | |
| **Dimensions (w x h x d) in mm** | | M8 x 50 | M12 x 50 | M18 x 60 | M30 x 60 | M12 x 55 | M18 x 60 | M30 x 62.5 |
| **Case** | | Nickel plated brass | | | | Nickel plated brass | | |
| **Sensing distance Sn (mm)** | | 2.5 | 4 | 8 | 15 | 7 | 12 | 22 |
| **Connection** | **Pre-cabled** | ● | ● | ● | ● | ● | | |
| | **Connector** | ● | ● | ● | ● | ● | | |
| | **Remote connector** | – | – | – | – | – | | |
| **Supply** | **⎓ 3-wire** | ● | ● *(1)* | ● *(1)* | ● *(1)* | ● | | |
| | **≂ 2-wire** | – | ● *(1)* | ● *(1)* | ● *(1)* | ● | | |
| **Type reference** | | **XS6 08B1** | **XS6 12 B1/B1M** | **XS6 18 B1/B1M** | **XS6 30 B1/B1M** | **XS6 12B4** | **XS6 18B4** | **XS6 30B4** |
| **Page(s)** | | 2/22 | 2/22 and 2/24 | | | 2/26 and 2/28 | | |

*(1) Depending on model.*

# Proximity sensors
## Inductive proximity sensors
## Osiprox® Universal



| Flat | | |
|---|---|---|
| **Form E** | **Form C** | **Form D** |
| ***Osi**concept* | ***Osi**concept* | ***Osi**concept* |
|  |  |  |
| Flush mountable and non flush mountable | | |
| 26 x 26 x 13 | 40 x 40 x 15 | 80 x 80 x 26 |
| Plastic, PBT | | |
| 15 | 25 | 60 |
| • | | |
| • | | |
| • | | |
| • | | |
| • | | |
| **XS8 E** | **XS8 C** | **XS8 D** |
| 2/30 | | |

# Proximity sensors
## Inductive proximity sensors
## Osiprox® Optimum



| Case | | Flat | | | | |
|---|---|---|---|---|---|---|
| | | Form J | Form F | Form E | Form C | Form D |
| | |  | | | | |
| Flush mountability | | Flush mountable | | | | |
| Dimensions (w x h x d) in mm | | 8 x 22 x 8 | 15 x 32 x 8 | 26 x 26 x 13 | 40 x 40 x 15 | 80 x 80 x 26 |
| Case | | Plastic, PBT | | | Plastic, PBT | |
| Sensing distance Sn (mm) | | 2.5 | 5 | 10 | 15 | 40 |
| Connection | Pre-cabled | ● | ● | ● | ● | ● |
| | Connector | – | – | ● | ● | ● |
| | Remote connector | ● | ● | ● | ● | ● |
| Supply | ⎓ 3-wire | ● | ● | ● | ● | ● |
| | ⎓ 2-wire | ● | ● | ● | ● | ● |
| Type reference | | XS7 J | XS7 F | XS7 E | XS7 C | XS7 D |
| Page | | 2/32 | 2/32 | 2/34 | 2/34 | |

# Proximity sensors
## Inductive proximity sensors
## Osiprox® Optimum



| Cylindrical | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Increased range | | | | | Standard range | | | |
| Ø 6 | Ø 8 | Ø 12 | Ø 18 | Ø 30 | Ø 8 | Ø 12 | Ø 18 | Ø 30 |
|  |  |  |  |  |  |  |  |  |
| Flush mountable | | | | | Flush mountable | | | |
| M8 x 33 | M8 x 33 | M12 x 33 | M18 x 36,5 | M30 x 40.6 | M8 x 33 | M12 x 33 | M18 x 36.5 | M30 x 40.6 |
| Nickel plated brass | | | | | Nickel plated brass | | | |
| 2.5 | 2.5 | 4 | 10 | 20 | 1.5 | 2 | 5 | 10 |
| • | • | • | • | • | • | • | • | • |
| • | • | • | • | • | • | • | • | • |
| – | – | – | – | – | – | – | – | – |
| • | • | • | • | • | • | • | • | • |
| – | – | – | – | – | • | • | • | • |
| **XS1 L06••349•** | **XS1 N08••349•** | **XS1 N12••349•** | **XS1 N18••349•** | **XS1 N30••349•** | **XS5 08B1•** | **XS5 12B1•** | **XS5 18B1•** | **XS5 30B1•** |
| 2/36 | | | | | 2/38 | | | |

# Proximity sensors
## Inductive proximity sensors
## Osiprox® Technology



| Application series: sensors for specific tasks | | Plastic case sensors | Basic sensors | Miniature sensors |
|---|---|---|---|---|
| Developed in accordance with the needs expressed by our customers, these sensors provide a complete solution for specific application functions: rotation monitoring, selective detection, analogue control, etc. | | *Food and beverage processing, chemical industry, marine sector* | *Standard machines, clean environment* | *Assembly machines for small parts* |
| | |  |  |   |
| **Form** | **Cylindrical** | Threaded: M8, M12, M18, M30 | Plain: Ø 6.5<br>Threaded: M8, M12, M18, M30 | Plain: Ø 4, Ø 6.5<br>Threaded: M5 |
| | **Block, dimensions (w x h x d) in mm** | – | – | – |
| **Case** | | Plastic | Nickel plated brass or plastic *(1)* | Brass or stainless steel *(1)* |
| **Sensing distance Sn (mm)** | **Flush mountable in metal sensors** | – | 1.5...10 *(1)* | 1...2.5 *(1)* |
| | **Non flush mountable in metal sensors** | 2.5... 15 *(1)* | 4...15 *(1)* | 2.5 |
| **Degree of protection** | | IP 67 or IP 68 | IP 67 | IP 67 |
| **Connection** | **Pre-cabled** | ● | ● | ● |
| | **Connector** | – | ● | – |
| | **Remote connector** | ● | – | |
| **Supply** | **⎓** | ● | ● | ● |
| | **∿** | ● | ● | – |
| | **≂** | – | – | – |
| **Type reference** | | **XS4 P** | **XS1 ●●B3**<br>**XS1 ●●BL●**<br>**XS2 ●●BL●** | **XS1 L**<br>**XS1 N**<br>**XS2 L** |
| **Page(s)** | | 2/42 | 2/44 | 2/54 |

*(1) Depending on model.*

# Proximity sensors
## Inductive proximity sensors
## Osiprox® Technology



| **Multivoltage sensors with short-circuit protection** | **Sensors with 2 complementary outputs** | |
|---|---|---|
| | **Solid-state outputs<br>NO + NC** | **Solid-state outputs<br>PNP + NPN,<br>NO/NC programmable** |
| *Simple machines or installations not having a low voltage DC supply* | *Assembly machines, conveyor systems, materials handling, robotics* | |
|  |  |  |
| Threaded: M12, M18, M30 | Plain: Ø 6.5<br>Threaded: M8, M12, M18, M30 | Threaded: M12, M18, M30 |
| – | – | – |
| Nickel plated brass | Nickel plated brass or stainless steel or plastic *(1)* | Nickel plated brass or plastic *(1)* |
| 2...10 | 1.5...10 | 2...10 |
| 4...15 | 2.5...15 | 4...15 |
| IP 67 or IP 68 *(1)* | | |
| ● | ● | ● |
| ● | ● | ● |
| – | – | – |
| ● | ● | ● |
| – | – | ● |
| ● | – | – |
| **XS1 M<br>XS2 M** | **XS1●●●●C410<br>XS2●●●●C410** | **XS1 M●●KP340<br>XS2 M●●KP340<br>XS4 P●●KP340** |
| 2/56 | 2/58 | 2/60 |

*(1) Depending on model.*

# Proximity sensors
## Inductive proximity sensors
## Osiprox® Application

2

| Application series: sensors for specific tasks | Osiprox® Application | | |
|---|---|---|---|
| | **Osiconcept® Application** | **Sensors for rotation monitoring** | **Sensors with analogue output** |
| **Developed in accordance with the needs expressed by our customers, these sensors provide a complete solution for specific application functions: rotation monitoring, selective detection, analogue control, etc.** | *Detection of passage of objects for machine tools, conveyor systems* | *Detection of underspeed, shaft overload and slowing down of conveyor belts* | *Position, displacement and deformation control/monitoring* |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Form** | **Cylindrical** | M12 (L = 54), M18 (L = 67), M30 (L = 71) | Threaded: M30 | – | Threaded: M12, M18, M30 | – |
| | **Block, dimensions (w x h x d) in mm** | – | – | 26 x 26 x 13<br>40 x 40 x 15 | – | 32 x 15 x 8<br>26 x 26 x 13<br>40 x 40 x 15<br>80 x 80 x 26 |
| **Case** | | Nickel plated brass | Metal, cylindrical | PBT block | Metal or plastic, cylindrical | PBT block |
| **Sensing distance (Sn) in mm** | **Flush mountable in metal sensors** | 5...18 *(1)* | 10 | 10…15 *(1)* | 0.2…10 *(1)* | 5…40 *(1)* |
| | **Non flush mountable in metal sensors** | – | 10 | 10…15 *(1)* | 0.4…60 *(1)* | 5…40 *(1)* |
| **Degree of protection** | | – | IP 67 | IP 67 | IP 67 | IP 67 or IP 68 *(1)* |
| **Supply** | ⎓ | ● | ● | ● | ● | ● |
| | ~ | – | – | – | – | ● |
| | ⎓ ~ | – | ● | ● | – | – |
| **Connection** | **Pre-cabled** | – | ● | – | ● | ● |
| | **Connector** | – | – | ● | – | ● |
| | **Remote connector** | ● | – | – | – | – |
| **Type reference** | | **XS6 12B2<br>XS6 18 B2<br>XS6 30 B2** | **XSA V** | **XS9 ●11R** | **XS1 M●●●AB1<br>XS4 P●●AB1** | **XS9 ●●●●A** |
| **Page(s)** | | 2/62 | 2/65 | 2/67 | 2/69 | 2/73, 2/75 |

*(1) Depending on model.*

# Proximity sensors
## Inductive proximity sensors
## Osiprox® Application



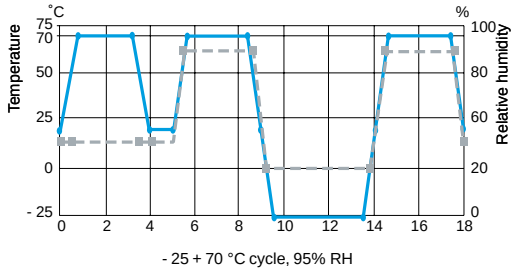
| Detection of metal objects: inductive sensors | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Factor 1 (Fe/Nfe) sensors** | | **Selective sensors** | **Sensors for assembly applications** | | | | **Sensors for welding machine applications** | **Sensors for food and beverage processing applications** | |
| | | | **Form G** | **Form C** | **Form cubic 40** | **Forme D increased range** | | **Cylindrical, stainless steel** | **Cylindrical, plastic** |
| *Detection of ferrous and non ferrous materials without variation of sensing distance* | | *Selective detection of ferrous materials only or non ferrous materials only* | *Applications for assembly machines, conveyor and materials handling systems* | | | | *Detection applications on welding machines* | *Detection of stainless steel and ferrous materials in food/beverage processing and pharmaceutical environments* | |
|  |  |  |  |  |   | |  |  |  |
| Threaded: M18, M30 | | Threaded: M18 | – | – | – | – | Threaded: M12, M18, M30. Ø 12, Ø 18 | Plain: Ø 18 Threaded: M12, M18, M30 | Threaded: M12, M18, M30 |
| 40 x 117 x 41 | | – | 12 x 40 x 26 | 40 x 117 x 41 | 40 x 40 x 40 | 80 x 80 x 40 | – | – | – |
| Metal, cylindrical or plastic, form C, turret head | | Metal, cylindrical, form A | Plastic | | | | Metal, cylindrical, threaded, Teflon coated | Stainless steel, grade 316 L | Plastic, PPS |
| 5, 10 or 15 *(1)* | | 5, 6 or 10 *(1)* | 2 | 15 to 20 | 15 | 50 | 2,3,5,10 *(1)* | – | – |
| – | | – | 4 | 20 to 40 | 20 | 42 | 4...10 *(1)* | 7...22 *(1)* | 7...22 *(1)* |
| IP 67 or IP 68 *(1)* | | IP 67 or IP 68 *(1)* | IP 67 | | | | IP 67 | IP 67 (connector version) IP 68 (pre-cabled version) IP 69K conforming to DIN 40050 | |
| ● | | ● | ● | ● | ● | ● | ● | ● | ● |
| – | | – | ● | ● | – | – | – | – | ● *(1)* |
| – | | – | ● | ● | ● | – | – | – | – |
| ● | | ● | ● | ● | ● | – | – | ● | ● |
| ● | | ● | ● | ● | ● | ● | ● | ● | ● |
| ● | | – | ● | ● | ● | – | – | – | – |
| **XS1 M ●●●KP** | **XS7 C40** | **XS1 M18PA** | **XS7 G XS8 G** | **XS7 C XS8 C** | **XS7 T XS8 T** | **XS7 D** | **XS● M XSL C** | **XS2 ●●SA** | **XS2 ●●AA** |
| 2/76 | 2/78 | 2/80 | 2/82 | 2/86 | 2/90 | 2/92 | 2/94 2/96 | 2/98 and 2/100 | 2/102 and 2/104 |

*(1) Depending on model.*

# Inductive proximity sensors

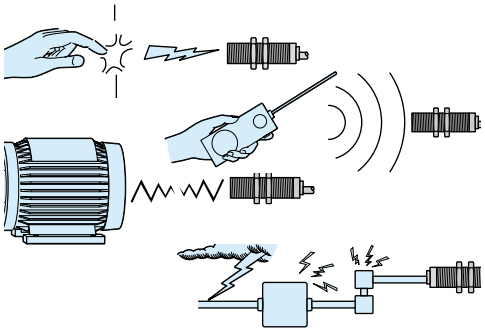


## Standards and certifications
## Parameters related to the environment




- 25 + 70 °C cycle, 95% RH

*Temperature °C*
*Humidity as %*



## Insulation

### Recommendations

The sensors detailed in this catalogue are designed for use in standard industrial applications relating to presence detection.
These sensors do not incorporate the required redundant electrical circuit enabling their usage in safety applications.
For safety applications, please refer to our “Safety solutions using Preventa” catalogue.

### Quality control

**Our inductive proximity sensors are subject to special precautions in order to guarantee their reliability in the most arduous industrial environments.**

- Qualification
  - The product characteristics stated in this catalogue are subject to a **qualification procedure** carried out in our laboratories.
  - In particular, the products are subjected to **climatic cycle** tests for 3000 hours whilst powered-up to verify their ability to maintain their characteristics over time.
- **Production**
  - The electrical characteristics and sensing distances at both ambient temperature and extreme temperatures are 100% checked.
  - Products are randomly selected during the course of production and subjected to **monitoring tests** relating to all their qualified characteristics.
- Customer returns

If, in spite of all these precautions, defective products are returned to us, they are subject to **systematic analysis** and **corrective actions** are implemented to eliminate the risks of the fault recurring.

### Conformity to standards

**All Schneider Electric brand inductive proximity sensors conform to and are tested in accordance with the recommendations of standard IEC 60947-5-2.**

### Mechanical shock resistance

The sensors are tested in accordance with standard IEC 60068-2-27, 50 gn, duration 11 ms.

### Vibration resistance

The sensors are tested in accordance with standard IEC 60068-2-6, amplitude ± 2 mm, f = 10…55 Hz, 25 gn at 55 Hz.

### Resistance to the environment

- Please refer to the characteristics pages for the various sensors.
- **IP 67**: protection against the effects of immersion.
  Test conforming to IEC 60529: sensor immersed for 30 minutes in 1 m of water.
  No deterioration in either operating or insulation characteristics is permitted.
- **IP 68**: protection against prolonged immersion.
  Sensor immersed for 336 hours in 40 metres of water at 50 °C.
  No deterioration in either operating or insulation characteristics is permitted.
  Schneider Electric sensors with an IP 68 degree of protection are ideal for use in the most arduous conditions, such as machine tools, automatic car washers.

### Resistance to electromagnetic interference

| | |
|---|---|
| ■ Electrostatic discharges | ∿ and ⩒ versions: level 4 immunity (15 kV). **IEC 61000-4-2** |
| ■ Radiated electromagnetic fields (electromagnetic waves) | ⎓, ∿ and ⩒ versions: level 2 (3 V/m) or level 3 (10 V/m) immunity. **IEC 61000-4-3** |
| ■ Fast transients (motor start/stop interference) | ⎓ version: level 3 immunity (1 kV). ∿ and ⩒ versions: level 4 immunity (2 kV) except Ø 8 mm model (level 2). **IEC 61000-4-4** |
| ■ Impulse voltage | ⎓, ∿ and ⩒ versions: level 3 immunity (2.5 kV) except Ø 8 mm and smaller models (level 1 kV). **IEC 60947-5-2** |

### Resistance to chemicals in the environment

- Owing to the very wide range of chemicals encountered in industry, it is very difficult to give general guidelines common to all sensors.
- To ensure lasting efficient operation, it is essential that any chemicals coming into contact with the sensors will not affect their casing and, in doing so, prevent their reliable operation.
- Cylindrical and flat plastic case sensors offer excellent overall resistance to:
  - chemical products such as salts, aliphatic and aromatic oils, petroleum, acids and diluted bases. For alcohols, ketones and phenols, preliminary tests should be made relating to the nature and concentration of the liquid.
  - food and beverage industry products such as animal or vegetable based products (vegetable oils, animal fat, fruit juice, dairy proteins, etc.).

In all cases, the materials selected (see product characteristics) provide satisfactory compatibility in most industrial environments (for further information, please consult your Regional Sales Office).

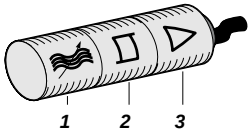
### Class 2 devices ⧈

Electrical insulation conforming to standards IEC 61140 and NF C 20-030 relating to means of protection against electric shock.

# Inductive proximity sensors

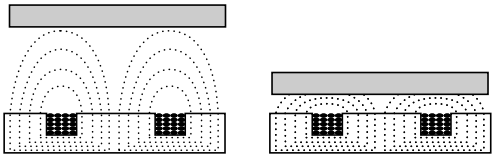


## Principle of inductive detection




*1 Oscillator*
*2 Output driver*
*3 Output stage*

*Composition of an inductive proximity sensor*



*Detection of a metal object*

### Operating principle

■ An inductive proximity sensor is solely for the detection of metal objects.
It basically comprises an oscillator whose windings constitute the sensing face.
An alternating magnetic field is generated in front of these windings.

■ When a metal object is placed within the magnetic field generated by the sensor, the resulting currents induced form an additional load and the oscillations cease.
This causes the output driver to operate and, depending on the sensor type, a normally open (NO) or normally closed (NC) output signal is produced.

### Inductive proximity detection

■ Inductive proximity sensors enable the detection, without physical contact, of metal objects.
■ Their range of applications is very extensive and includes:
□ monitoring the position of machine parts (cams, end stops, etc.),
□ counting the presence of metal objects, etc.

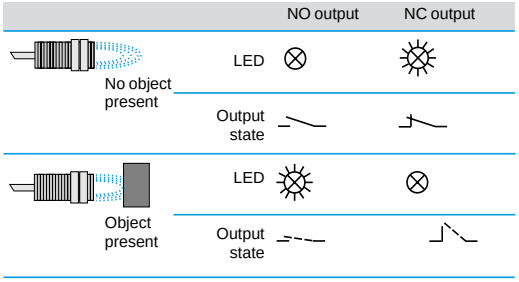
### Advantages of inductive detection

■ No physical contact with the object to be detected, thus avoiding wear and enabling detection of fragile objects, freshly painted objects, etc.
■ High operating rates. Fast response.
■ Excellent resistance to industrial environments (robust products, fully encapsulated in resin).
■ Solid-state technology: no moving parts, therefore service life of sensor not related to number of operating cycles.

### Osiconcept

■ **Osi**concept sensors are suitable for all metal environments (flush mountable or non flush mountable) since they ensure a maximum sensing distance, even if there is a metal background. Precise detection of the position of the object can be obtained using the teach mode. For further information, see page 2/20.

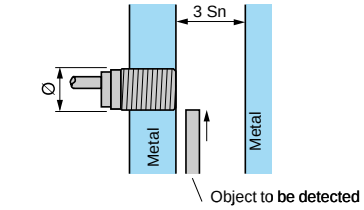
## LED indicator

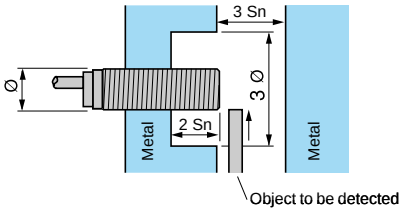



### Output LED

All Schneider Electric brand inductive proximity sensors incorporate an output state LED indicator.
**Osi**concept sensors are fitted with a green LED that indicates “Power on” and also assists the user during setting-up (teach mode).

## Mounting sensors on a metal support




### Sensors suitable for flush mounting in metal

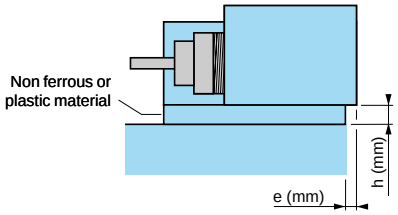
■ No side clearance required.
■ All models using the **Osi**concept system are flush mountable in metal without reducing the sensing distance and also enable the detection of an object against a metal background. For further information, see pages 2/20 and 2/21.

### Sensors not suitable for flush mounting in metal

■ Side clearance required.
Sensing distance greater than that for a standard flush mountable model.
■ The **Osi**concept system eliminates the side clearance requirement. For further information, see pages 2/20 and 2/21.

2

## Mounting sensors on a metal support



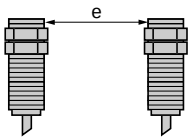

## Mounting using fixing clamp

- Standard flush mountable models: e = 0, h = 0
- Standard non flush mountable models:
  - Ø 6.5 / 8 / 12 mm: e = 0, h = 0,
  - Ø 18 mm: if h = 0, e ≥ 5; e = 0, h ≥ 3,

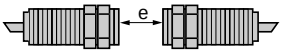
Ø 30 mm: if h = 0, e ≥ 8; e = 0, h ≥ 4.

- **Osi**concept models: e = 0, h = 0

## Mounting distance between sensors




*Mounting side by side*
*e ≥ 2 Sn*




*Mounting face to face*
*e ≥ 10 Sn*

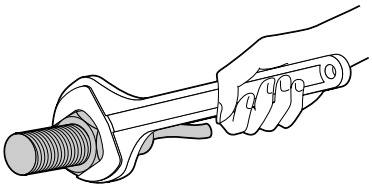
## Standard sensors

If 2 standard sensors are mounted too close to each other they are likely to lock in the “detection state” due to interference between their respective oscillating frequencies.
To avoid this condition, minimum mounting distances stated for the sensors should be adhered to or, alternatively, sensors with staggered oscillating frequencies should be used.

## Staggered frequency sensors

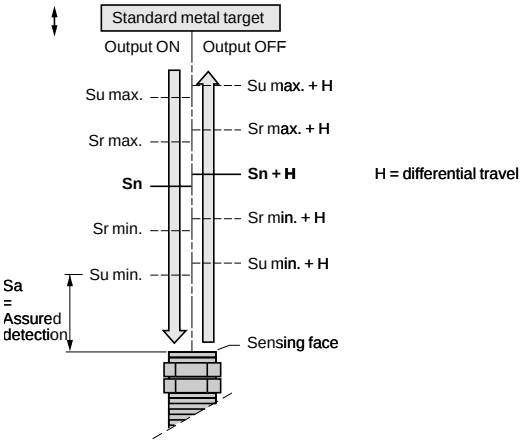
For applications where the minimum recommended mounting distances for standard sensors cannot be achieved, it is possible to overcome this restraint by using staggered frequency sensors. Please consult your Regional Sales Office.
In this case, a staggered frequency sensor is mounted adjacent to or opposite each standard sensor.

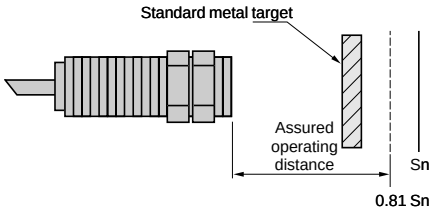
## Tightening torque for cylindrical type sensors



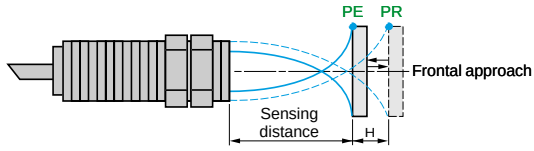
| | Maximum tightening torque for the various sensor case materials | | | |
|---|---|---|---|---|
| | Brass | Brass | Stainless steel | Plastic |
| Diameter of sensor (mm) | Short case model | Form A model | Form A model | All models |
| | XS5 ●●B1 | XS6 ●●B1<br>XS6 ●●B2<br>XSA V● | XS1 ●●<br>XS2 ●● | XS4 P●● |
| **Ø 5** | 1.6 N.m | 1.6 N.m | 2 N.m | – |
| **Ø 8** | 5 N.m | 5 N.m | 9 N.m | 1 N.m |
| **Ø 12** | 6 N.m | 15 N.m | 30 N.m | 2 N.m |
| **Ø 18** | 15 N.m | 35 N.m | 50 N.m | 5 N.m |
| **Ø 30** | 40 N.m | 50 N.m | 100 N.m | 20 N.m |

## Sensing distance

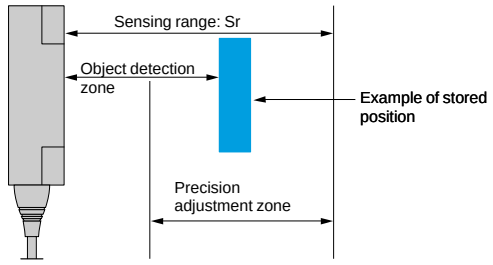


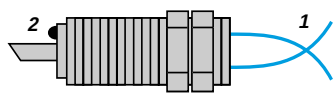




## Terminology




PE = pick-up point, the target is detected
PR = drop-out point, the target is no longer detected




*1 Detection threshold curves*
*2 "Object detected" LED*

### Definitions

In order to ensure that customers can make reliable product comparisons and selection, the standard IEC 60947-5-2 defines various sensing distances, such as:

- **Nominal sensing distance (Sn)**
  The rated operating distance for which the sensor is designed. It does not take into account any variations (manufacturing tolerances, temperature, voltage).
- **Real sensing distance (Sr)**
  The real sensing distance is measured at the rated voltage (Un) and the rated ambient temperature (Tn).
  It must be between 90% and 110% of the nominal sensing distance (Sn):
  $0.9\ Sn \leq Sr \leq 1.1\ Sn$.
- **Usable sensing distance (Su)**
  The usable sensing distance is measured at the limits of the permissible variations in the ambient temperature (Ta) and the supply voltage (Ub). It must be between 90% and 110% of the real sensing distance: $0.9\ Sr \leq Su \leq 1.1\ Sr$.
- **Assured sensing distance (Sa).**
  This is the operating zone of the sensor. The assured operating distance is between 0 and 81% of the nominal sensing distance (Sn): $0 \leq Sa \leq 0.9 \times 0.9 \times Sn$

### Standard metal target

The standard IEC 60947-5-2 defines the standard metal target as a square mild steel (Fe 360) plate, 1 mm thick.
The side dimension of the plate is either equal to the diameter of the circle engraved on the sensing face of the sensor or 3 times the nominal sensing distance (Sn).

### Differential travel

The differential travel (H), or hysteresis, is the distance between the pick-up point, as the standard metal target moves towards the sensor, and the drop-out point, as it moves away. This hysteresis is essential for the stable operation of the sensor.

### Repeat accuracy

The repeat accuracy (R) is the repeatability of the sensing distance between successive operations. Readings are taken over a period of time whilst the sensor is subjected to voltage and temperature variations: 8 hours, 10 to 30 °C, Un ± 5%.
It is expressed as a percentage of Sr.

### Detection zone and precision adjustment zone

- By using sensitivity adjustment in teach mode, **Osi**concept proximity sensors enable the position of an object to be detected as it approaches from the front or side.
  The teach mode can be used when the object is located in the zone known as the "precision adjustment zone". When the object approaches from the front, the detection zone of the object ranges from the stored position down to zero.

### Operating zone

- The operating zone relates to the area in front of the sensing face in which the detection of a metal object is certain.
  The values stated in the characteristics relating to the various types of sensor are for steel objects of a size equal to the sensing face of the sensor.
  For objects of a different nature (smaller than the sensing face of the sensor, other metals, etc.), it is necessary to apply a correction coefficient.

2

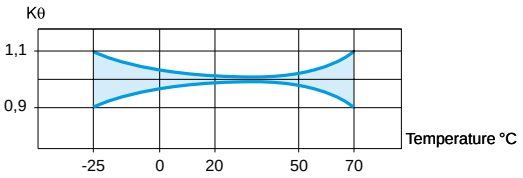
## Correction coefficients to apply to the assured operating distance

### Assured operating distance of a sensor

In practice, most objects to be detected are generally made of steel and are of a size equal to, or greater, than the sensing face of the sensor.

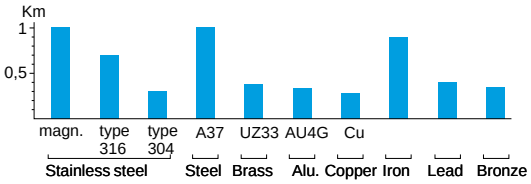
For the calculation of the assured operating distance for different operating conditions, one must take into account the correction coefficients that influence it.

*The curves indicated are purely representative of typical curves. They are only given as a guide to the approximate usable sensing distance of a proximity sensor for a given application.*




### Influence of ambient temperature

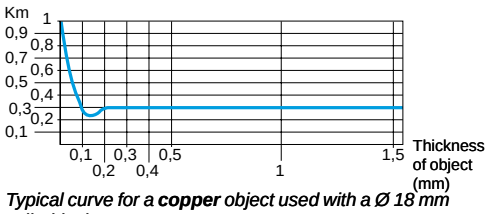
Apply a correction coefficient Kθ, determined from the curve shown opposite.




### Material of object to be detected

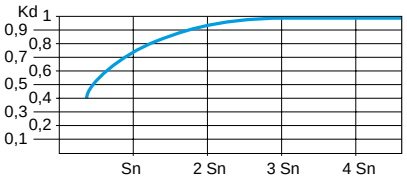
Apply a correction coefficient Km, determined from the diagram shown opposite.

The fixed sensing distance models for ferrous/non ferrous (Fe/NFe) materials enable the detection of different objects at a fixed distance, irrespective of the type of material.




*Typical curve for a **copper** object used with a Ø 18 mm cylindrical sensor*

Special case of a very thin object made of a non ferrous material.




*Typical curve for a **steel** object used with a Ø 18 mm cylindrical sensor*

### Size of object to be detected

Apply a correction coefficient Kd, determined from the curve shown opposite.
When calculating the sensing distance for the selection of a sensor, make the assumption that Kd = 1.

### Variation of supply voltage

In all cases, apply the correction coefficient Kt = 0.9.

## Calculation examples

### Correction of the sensing distance of a sensor

Sensor with nominal sensing distance Sn = 15 mm.
Ambient temperature variation 0 to + 20 °C.
Object material and size: steel, 30 x 30 x 1 mm thick.
The assured operating distance Sa is determined using the formula:
**Sa = Sn x Kq x Km x Kd x Kt =** 15 x 0.98 x 1 x 0.95 x 0.9
i.e. Sa = 12.5 mm.

### Selecting a sensor for a given application

Application characteristics:
- object material and size: iron (Km = 0.9), 30 x 30 mm,
- temperature: 0 to 20 °C (Kθ = 0.98),
- object detection distance: 3 mm ± 1.5 mm, i.e. Sa max. = 4.5 mm,
- assume Kd = 1.

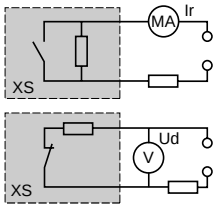
A sensor must be selected for which $\mathbf{Sn \geq \frac{Sa}{Kq \times Km \times Kd \times Kt} = \frac{4.5}{0.98 \times 0.9 \times 1 \times 0.9}}$

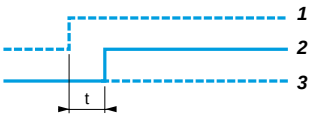
i.e. **Sn ≥ 5.7 mm**

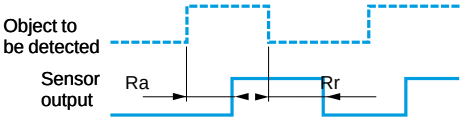
# Inductive proximity sensors



## Specific aspects of electronic sensors




### Terminology

■ Residual current (Ir)
□ The residual current (Ir) corresponds to the current flowing through the sensor when in the "open" state.
□ Characteristic of 2-wire type proximity sensors.

■ Voltage drop (Ud)
□ The voltage drop (Ud) corresponds to the voltage drop at the sensor's terminals when in the "closed" state (value measured at nominal current rating of sensor).

■ First-up delay
□ The first-up delay corresponds to the time (t) between the connection of the power supply to the sensor and its fully operational state.

***1*** *Supply voltage U on*
***2*** *Sensor operational at state 1*
***3*** *Sensor at state 0*

■ Delays
□ Response time (Ra): the time delay between the object to be detected entering the sensor's operating zone and the subsequent change of output state. This parameter limits the speed and size of the object.
□ Recovery time (Rr): the time delay between an object to be detected leaving the sensor's operating zone and the subsequent change of output state. This parameter limits the interval between successive objects.

## Power supply

### Sensors for a.c. circuits (∿ and ⎓ models)

Check that the voltage limits of the sensor are compatible with the nominal voltage of the a.c. supply used.

### Sensors for d.c. circuits

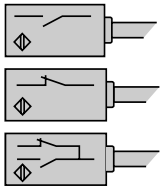
■ **d.c. source:** check that the voltage limits of the sensor and the acceptable level of ripple are compatible with the supply used.

■ **a.c. source** (comprising transformer, rectifier, smoothing capacitor): the supply voltage must be within the operating limits specified for the sensor.

Where the voltage is derived from a single-phase a.c. supply, the voltage must be rectified and smoothed to ensure that:
- the peak voltage of the d.c. supply is lower than the maximum voltage rating of the sensor.
Peak voltage = nominal voltage x $\sqrt{2}$
- the minimum voltage of the supply is greater than the minimum voltage rating of the sensor, given that:
$\Delta V = (I \times t) / C$,
$\Delta V$ = max. ripple: 10% (V),
I = anticipated load current (mA),
t = period of 1 cycle (10 ms full-wave rectified for a 50 Hz supply frequency),
C = capacitance (µF).
As a general rule, use a transformer with a lower secondary voltage (Ue) than the required d.c. voltage (U).

**Example:**
∿ 18 V to obtain ⎓ 24 V,
∿ 36 V to obtain ⎓ 48 V.

## Outputs



### Output signal (contact logic)

■ Normally open (NO)
Corresponds to a sensor whose output changes to the closed state when an object is present in the operating zone.

■ Normally closed (NC)
Corresponds to a sensor whose output changes to the open state when an object is present in the operating zone.

■ Complementary outputs (NO + NC)
Corresponds to a sensor with a normally closed output and a normally open output.

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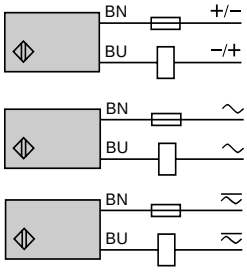
## Outputs (continued)



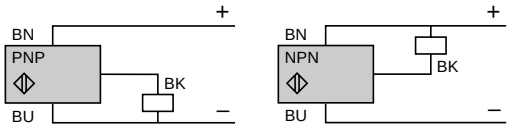

### 2-wire type ⎓, non polarised NO or NC output

■ **Specific aspects**

These sensors are wired in series with the load to be switched.
As a consequence, they are subject to:
- a residual current in the open state (current flowing through the sensor in the “open” state),
- a voltage drop in the closed state (voltage drop across the sensor’s terminals in the “closed” state).

■ **Advantages**
- Only 2 leads to be wired: these sensors can be wired in series in the same way as mechanical limit switches,
- They can be connected to either positive (PNP) or negative (NPN) logic PLC inputs,
- No risk of incorrect connections.

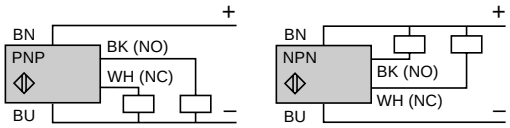
■ **Operating precautions**
- Check the possible effects of residual current and voltage drop on the actuator or input connected,
- For sensors that do not have overload and short-circuit protection (a.c. or a.c./d.c. symbol), it is essential to connect a 0.4 A “quick-blow” fuse in series with the load.




### 3-wire type ⎓, NO or NC output, PNP or NPN

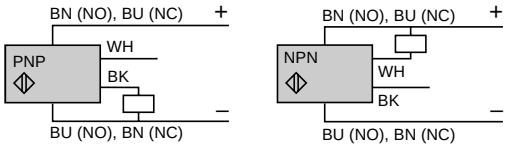
■ **Specific aspects**
- These sensors comprise 2 wires for the d.c. supply and a 3rd wire for the output signal,
- PNP type: switching the positive side to the load,
- NPN type: switching the negative side to the load.

■ **Advantages**
- Protection against supply reverse polarity,
- Protection against overload and short-circuit,
- No residual current, low voltage drop.



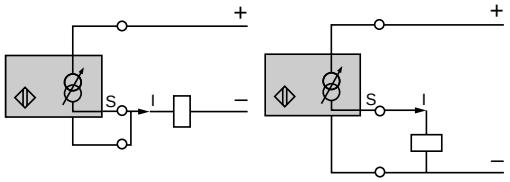

### 4-wire type, complementary outputs ⎓, NO and NC outputs, PNP or NPN

■ **Advantages**
- Protection against supply reverse polarity (+/-).
- Protection against overload and short-circuit.




### 4-wire type, multifunction, programmable ⎓, NO or NC output, PNP or NPN

■ **Advantages**
- Protection against supply reverse polarity (+/-).
- Protection against overload and short-circuit.




*2-wire connection* *3-wire connection*

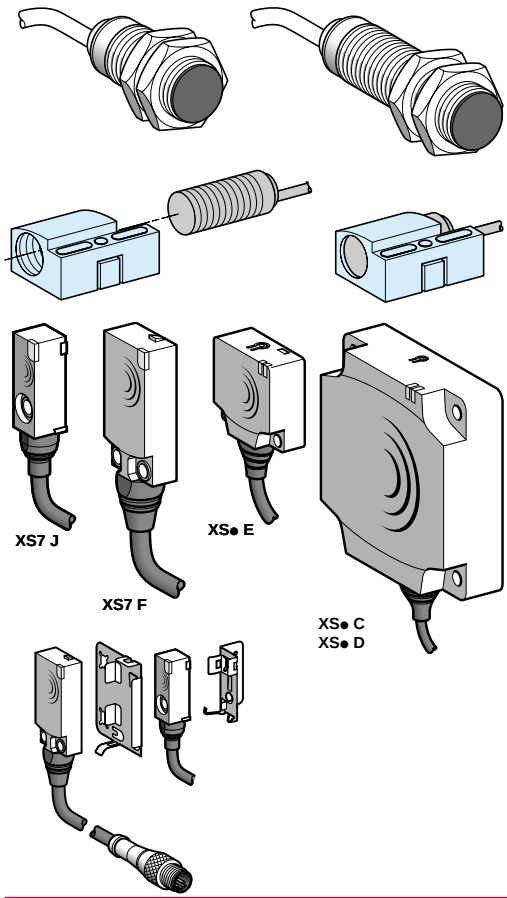
### Specific output signals, analogue type

■ These sensors convert the approach of a metal object towards the sensing face into an output current variation which is proportional to the distance between the object and the sensing face.
■ Two models available:
- 0...10 V (0...10 mA) output for 3-wire connection,
- 4-20 mA output for 2-wire connection.

# Inductive proximity sensors



## Features of the various models

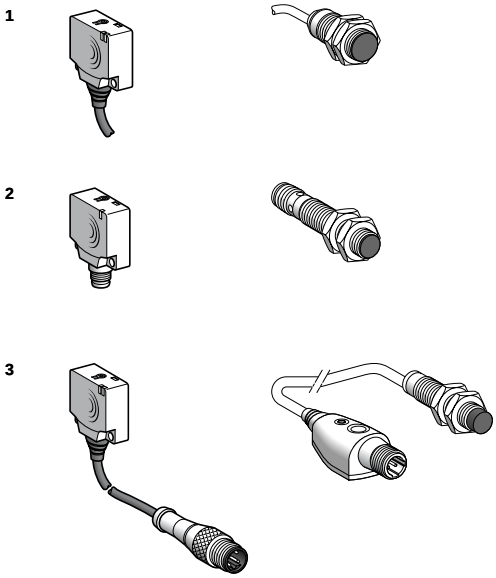



### Types of case

■ **Cylindrical case**
- □ Fast installation and setting-up.
- □ Pre-cabled and connector versions.
- □ Small size facilitates mounting in locations with restricted access.
- □ **Interchangeability**, provided by indexed **fixing clamp**: when assembled, becomes similar to a block type sensor.

■ **Flat case**
- □ Reduced size (sensor volume divided by 8).
- □ Fast installation by mounting on clip-on brackets.
- □ Precision detection using **Osi**concept teach mode.

## Electrical connection




### Connection methods

1 **Pre-cabled:** factory fitted moulded cable, good protection against splashing liquids (IP 68). Example: machine tool.
**2 Connector:** easy installation and maintenance (IP 67).
**3 Remote connector:** easy installation and maintenance (IP 68 at sensor level and IP 67 at remote connector level).

### Wiring advice

■ **Length of cable**
- □ No limitation up to 200 m or up to a line capacitance of < 100 nF (characteristics of sensor remain unaffected).
- □ In this case, it is important to take into account the voltage drop on the line.

■ **Separation of control and power circuit wiring**
- □ The sensors are immune to electrical interference encountered in normal industrial conditions.
- □ Where extreme conditions of electrical “noise” could occur (large motors, spot welders, etc.), it is advisable to protect against transients in the normal way:

- suppress interference at source,
- separate power and control wiring from each other,
- smooth the supply,
- limit the length of cable.

■ **Connect the sensor with supply switched off.**

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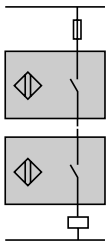
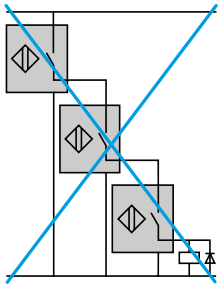
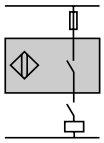
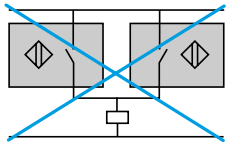
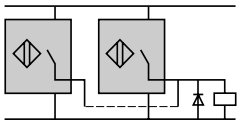
## Setting-up precautions

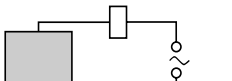


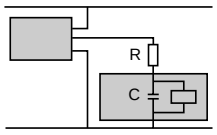


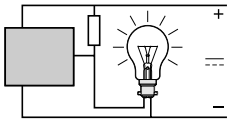


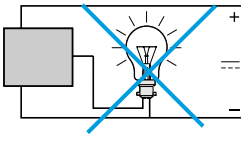












### Connection in series

#### 2-wire type sensors

- The following points should be taken into account:
  - Series wiring is only possible using sensors with wide voltage limits.
    Based on the assumption that each sensor has the same residual current value, each sensor, in the open state, will share the supply voltage, i.e.

$$U\ sensor = \frac{U\ supply}{n\ sensors}$$

U sensor and U supply must remain within the sensor's voltage limits.

- If only one sensor in the circuit is in the open state, it will be supplied at a voltage almost equal to the supply voltage.
- When in the closed state, a small voltage drop is present across each sensor. The resultant loss of voltage at the load will be the sum of the individual voltage drops and therefore, the load voltage should be selected accordingly.

#### 3-wire type sensors

**This connection method is not recommended.**

- Correct operation of the sensors cannot be assured and, if this method is used, tests should be made before installation.
  The following points should be taken into account:
  - Sensor 1 carries the load current in addition to the no-load current consumption values of the other sensors connected in series. For certain models, this connection method is not possible unless a current limiting resistor is used.
  - When in the closed state, a small voltage drop is present across each sensor. The load should therefore be selected accordingly.
  - As sensor 1 closes, sensor 2 does not operate until a certain time (t) has elapsed (corresponding to the first-up delay) and likewise for the following sensors in the sequence.
  - The use of "flywheel" diodes is recommended when an inductive load is being switched.

#### Sensors and devices in series with an external mechanical contact

**2 and 3-wire type sensors**

- The following points should be taken into account:
  - When the mechanical contact is open, the sensor is not supplied.
  - When the contact closes, the sensor does not operate until a certain time (t) has elapsed (corresponding to the first-up delay).

### Connection in parallel

#### 2-wire type sensors

**This connection method is not recommended.**

- Should one of the sensors be in the closed state, the sensor in parallel will be "shorted-out" and no longer supplied.
  As the first sensor passes into the open state, the second sensor will become energised and will be subject to its first-up delay.
- This configuration is only permissible where the sensors will be working alternately.
- This method of connection can lead to irreversible damage of the units.

#### 3-wire type sensors

- No specific restrictions. The use of "flywheel" diodes is recommended when an inductive load (relay) is being switched.

### a.c. supply

- **2-wire type sensors cannot be connected directly to an a.c. supply.**
  - This would result in immediate destruction of the sensor and considerable danger to the user.
  - An appropriate load (refer to the instruction sheet supplied with the sensor) must always be connected in series with the sensor.

### Capacitive load (C > 0.1 µF)

- On power-up, it is necessary to limit (by resistor) the charging current of the capacitive load C.
  - The voltage drop in the sensor can also be taken into account by subtracting it from the supply voltage for the calculation of R.

$$R = \frac{U\ (supply)}{I\ max.\ (sensor)}$$

### Load comprising an incandescent lamp

- If the load comprises an incandescent lamp, the cold state resistance can be 10 times lower than the hot state resistance. This can cause very high current levels on switching. Fit a pre-heat resistor in parallel with the sensor.

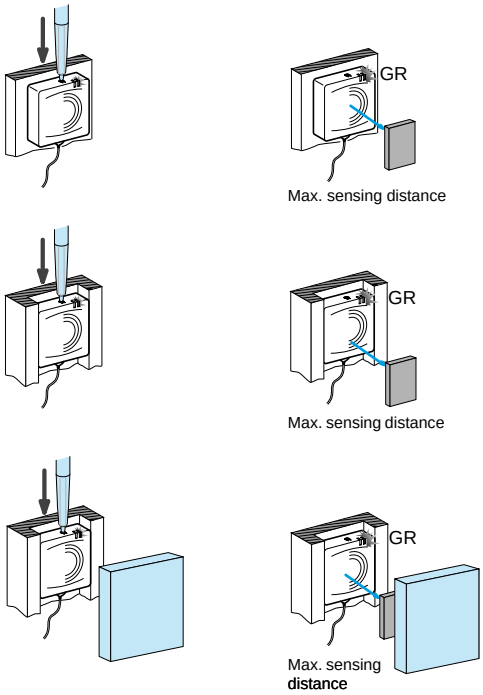
$R = \frac{U^2}{P} \times 10$, U = supply voltage and P = lamp power

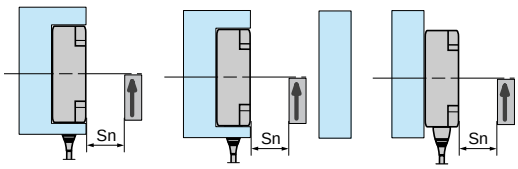
## Fast troubleshooting guide

| Problem | Possible causes | Remedy |
|---|---|---|
| **The sensor's output will not change state when a metal object enters the detection zone** | On an **Osi**concept sensor: setting-up or programming error. | ■ After a RESET, follow the environment teach mode procedure. Refer to instruction sheet supplied with sensor. |
| | Output stage faulty or complete failure of the sensor or the short-circuit protection has tripped. | ■ Check that the sensor is compatible with the supply being used.<br>■ Check the load current characteristics:<br>□ if load current I ≥ maximum switching capacity, an auxiliary relay, of the CAD N type for example, should be interposed between the sensor and the load,<br>□ if I ≤ maximum switching capacity, check for wiring faults (short-circuit).<br>■ In all cases, a 0.4 A "quick-blow" fuse should be fitted in series with the sensor. |
| | Wiring error | ■ Check that the wiring conforms to the wiring shown on the sensor label or instruction sheet. |
| | Supply fault | ■ Check that the sensor is compatible with the supply (∿ or ⎓).<br>■ Check that the supply voltage is within the voltage limits of the sensor. Remember that with a rectified, smoothed supply,<br>U peak = U nominal x $\sqrt{2}$ with a ripple voltage ≤ 10%. |
| **False or erratic operation, with or without the presence of a metal object in the detection zone** | On an **Osi**concept sensor: setting-up or programming error. | ■ After a RESET, follow the environment teach mode procedure. Refer to instruction sheet supplied with sensor. |
| | Influence of background or metal environment | ■ Refer to the instruction sheet supplied with the sensor. For sensors with adjustable sensitivity, reduce the sensing distance. |
| | Operating distance poorly defined for the object to be detected | ■ Apply the correction coefficients.<br>■ Realign the system or run the teach mode again. |
| | Influence of transient interference on the supply lines | ■ Ensure that any d.c. supplies, when derived from rectified a.c., are correctly smoothed (C > 400 µF).<br>■ Separate a.c. power cables from low-level d.c. cables (24 V low level).<br>■ Where very long distances are involved, use suitable cable: screened and twisted pairs of the correct cross-sectional area. |
| | Equipment prone to emitting electromagnetic interference | ■ Position the sensors as far away as possible from any sources of interference. |
| | Response time of the sensor too slow for the particular object being detected | ■ Check the suitability of the sensor for the position or size of the object to be detected.<br>■ If necessary, select a sensor with a higher switching frequency. |
| | Influence of high temperature | ■ Eliminate sources of radiated heat or protect the sensor casing with a heat shield.<br>■ Realign, having adjusted the temperature around the fixing support. |
| **No detection following a period of service** | Vibration, shock | ■ Realign the system.<br>■ Replace the support or protect the sensor. |

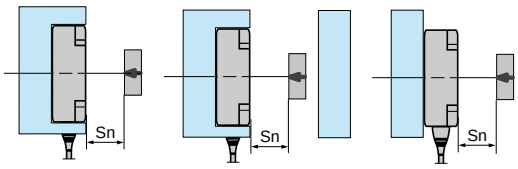
# Inductive proximity sensors
Osiprox®
**Osi**concept®: **O**ffering **S**implicity through **I**nnovation



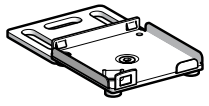


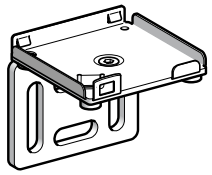



Precision side approach detection



Precision frontal approach detection





## Operating principle

In proposing the **Osi**concept technology, Schneider Electric brand offers simplicity through innovation.

■ With **Osi**concept, a single product meets all metal object detection needs.
By simply pressing the “Teach mode” pushbutton, the product automatically takes up an optimum configuration for all detection, flush mountability and environment requirements.

■ Other advantages of **Osi**concept:
□ □Increased performance:
- sensing distance guaranteed and optimized irrespective of the mounting configuration, the object, the environment or the background,
- suitable for all metal environments.

□ □Simplified use provided by:
- the **Osi**concept technology associated with the availability of the flattest, most compact sensors on the market ensuring that the sensor is fully built into the machine, thereby limiting risks of mechanical damage,
- mechanical adjustments being eliminated through the use of the teach mode.

□ Lower costs due to:
- adjustment times and complex supports being eliminated,
- the elimination of flush mountable and non flush mountable versions which halves the number of references,
- much easier and much quicker product selection.

## Precision position detection

All **Osi**concept inductive proximity sensors benefit from ultra precise adjustment which is very quick irrespective of the metal environment.

■ Precision side approach detection makes it possible to accurately define the position at which the object will be detected as it passes the sensor.
Due to the **Osi**concept technology, the desired detection position can be stored in memory by simply pressing the teach button.

■ Precision frontal approach detection makes it possible to accurately define the position at which the object will be detected as it approaches the sensor.
Due to the **Osi**concept technology, the desired detection position can be stored in memory by simply pressing the teach button.

## Mounting accessories

Schneider Electric brand proposes a complete, inexpensive range of mounting accessories (clamps, plates, brackets, etc.) providing solutions to all setting-up problems.

■ Fixing kits enable quick installation or replacement of **Osi**concept sensors.

■ No adjustment is required. Simple clipping-in enables the sensor to be fixed in position and ready for operation.

# Inductive proximity sensors

Osiprox®

**Osi**concept®: **O**ffering **S**implicity through **I**nnovation



XS8 E1A1

XS8 C1A1

XS8 D1A1

XS6 12B2

XS6 18B2

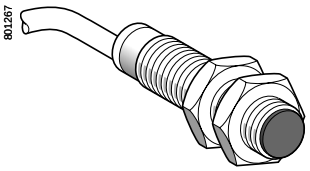
XS6 30B2

| Block type | | | | |
|---|---|---|---|---|
| **Dimensions (mm)** | | 26 x 26 x 13 | 40 x 40 x 15 | 80 x 80 x 26 |
| **Sensing distance (mm)** | Flush mounted use | 0...10 | 0...15 | 0...40 |
| | Non flush mounted use | 0...15 | 0...25 | 0...60 |
| **Sensor type** | | **XS8 E1A1** | **XS8 C1A1** | **XS8 D1A1** |
| **Page** | | 2/30 | | |

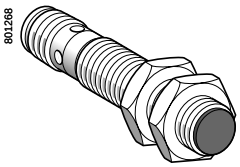
| Cylindrical type | | | | |
|---|---|---|---|---|
| **Dimensions (mm)** | | 12 | 18 | 30 |
| **Sensing distance (mm)** | Flush mounted use | 0...3.4 | 0...6 | 0...11 |
| | Non flush mounted use | 0...5 | 0...9 | 0...18 |
| **Sensor type** | | **XS6 12B2** | **XS6 18B2** | **XS6 30B2** |
| **Page** | | 2/62 | | |

# Inductive proximity sensors
## Osiprox® Universal
### Cylindrical, flush mountable
### Three-wire, d.c. supply, solid-state output

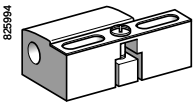





*XS6 ●●B1●●L2*




*XS6 ●●B1●●M12*




*XSZ B●●●*

### Ø 8, threaded M8 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS6 08B1PAL2** | 0.035 |
| | | | M12 connector | **XS6 08B1PAM12** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS6 08B1NAL2** | 0.035 |
| | | | M12 connector | **XS6 08B1NAM12** | 0.015 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS6 08B1PBL2** | 0.035 |
| | | | M12 connector | **XS6 08B1PBM12** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS6 08B1NBL2** | 0.035 |
| | | | M12 connector | **XS6 08B1NBM12** | 0.015 |

### Ø 12, threaded M12 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **4** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS6 12B1PAL2** | 0.075 |
| | | | M12 connector | **XS6 12B1PAM12** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS6 12B1NAL2** | 0.075 |
| | | | M12 connector | **XS6 12B1NAM12** | 0.020 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS6 12B1PBL2** | 0.075 |
| | | | M12 connector | **XS6 12B1PBM12** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS6 12B1NBL2** | 0.075 |
| | | | M12 connector | **XS6 12B1NBM12** | 0.020 |

### Ø 18, threaded M18 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **8** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS6 18B1PAL2** | 0.100 |
| | | | M12 connector | **XS6 18B1PAM12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS6 18B1NAL2** | 0.100 |
| | | | M12 connector | **XS6 18B1NAM12** | 0.040 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS6 18B1PBL2** | 0.100 |
| | | | M12 connector | **XS6 18B1PBM12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS6 18B1NBL2** | 0.100 |
| | | | M12 connector | **XS6 18B1NBM12** | 0.040 |

### Ø 30, threaded M30 x 1.5

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **15** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS6 30B1PAL2** | 0.205 |
| | | | M12 connector | **XS6 30B1PAM12** | 0.145 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS6 30B1NAL2** | 0.205 |
| | | | M12 connector | **XS6 30B1NAM12** | 0.145 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS6 30B1PBL2** | 0.205 |
| | | | M12 connector | **XS6 30B1PBM12** | 0.145 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS6 30B1NBL2** | 0.205 |
| | | | M12 connector | **XS6 30B1NBM12** | 0.145 |

### Accessories *(2)*

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 8 | **XSZ B108** | 0.006 |
| | Ø 12 | **XSZ B112** | 0.006 |
| | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

*(1) For a 5 m long cable, replace L2 with **L5**, and for a 10 m long cable, replace L2 with **L10**.*
*Example: XS6 08B1PAL2 becomes **XS6 08B1PAL5** with a 5 m long cable.*
*(2) For further information, see page 2/106.*

# Inductive proximity sensors
## Osiprox® Universal
Cylindrical, flush mountable
Three-wire, d.c. supply, solid-state output



## Characteristics

| Sensor type | | | XS6 ●●B1●●M12 | XS6 ●●B1●●L2 |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | |
| **Connection** | Connector | | M12 | – |
| | Pre-cabled | | – | Length: 2 m |
| **Operating zone** | Ø 8 | **mm** | **0…2** | |
| | Ø 12 | **mm** | **0…3.2** | |
| | Ø 18 | **mm** | **0…6.4** | |
| | Ø 30 | **mm** | **0…12** | |
| **Differential travel** | | **%** | 1…15 of real sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | IP 68 double insulation ⧈ (except Ø 8: IP 67) |
| | Conforming to DIN 40050 | | IP 69K for Ø12 to Ø30 | |
| **Storage temperature range** | | **°C** | - 40…+ 85 | |
| **Operating temperature range** | | **°C** | - 25…+ 70 | |
| **Materials** | Case | | Nickel plated brass except **XS6 08**: stainless steel grade 303 | |
| | Pre-cabled | | – | PvR 3 x 0.34 mm² (except **XS6 08:** 3 x 0.11 mm²) |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Output state indication** | | | LED (yellow), 4 viewing ports at 90° | LED (yellow), annular |
| **Rated supply voltage** | | **V** | ⎓ 12…48 with protection against reverse polarity | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…58 | |
| **Switching capacity** | | **mA** | ≤ 200 with overload and short-circuit protection | |
| **Voltage drop, closed state** | | **V** | ≤ 2 | |
| **Current consumption, no-load** | | **mA** | ≤ 10 | |
| **Maximum switching frequency** | **XS6 08B1●●●●, XS6 12B1●●●●** | **Hz** | 2500 | |
| | **XS6 18B1●●●●** | **Hz** | 1000 | |
| | **XS6 30B1●●●●** | **Hz** | 500 | |
| **Delays** | First-up | **ms** | ≤ 10 | |
| | Response | **ms** | ≤ 0.2 for Ø8 and Ø12, ≤ 0.3 for Ø18, ≤ 0.6 for Ø30 | |
| | Recovery | **ms** | ≤ 0.2 for Ø8 and Ø12, ≤ 0.7 for Ø18, ≤ 1.4 for Ø30 | |

## Wiring scheme

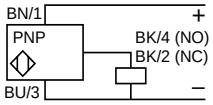
**Connector**

M12

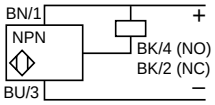

**Pre-cabled**

BU : Blue
BN : Brown
BK : Black

**PNP**



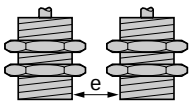

**NPN**

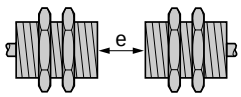


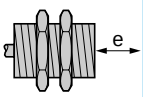

*See connection on page 9/45.*

## Setting-up

**Minimum mounting distances (mm)**



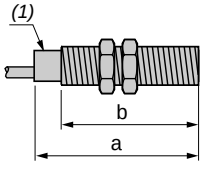




| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 8 | e ≥ 5 | e ≥ 30 | e ≥ 8 |
| Ø 12 | e ≥ 8 | e ≥ 50 | e ≥ 12 |
| Ø 18 | e ≥ 16 | e ≥ 100 | e ≥ 25 |
| Ø 30 | e ≥ 30 | e ≥ 180 | e ≥ 45 |

## Dimensions

**XS6**

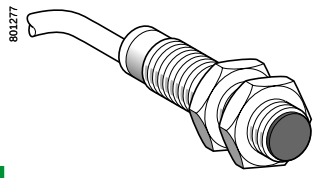



*(1) LED*

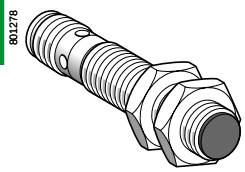
| XS6 | Pre-cabled (mm) a | Pre-cabled (mm) b | Connector (mm) a | Connector (mm) b |
|---|---|---|---|---|
| Ø 8 | 50 | 42 | 61 | 40 |
| Ø 12 | 50 | 42 | 61 | 42 |
| Ø 18 | 61.4 | 51 | 71.5 | 51 |
| Ø 30 | 61.8 | 51 | 71.8 | 51 |

# Inductive proximity sensors
## Osiprox® Universal
### Cylindrical, flush mountable
### Two-wire, a.c. or d.c. supply *(1)*

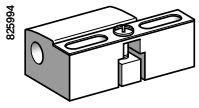





*XS6 ●●B1M●L2*




*XS6 ●●B1M●U20*




*XSZ B1●●*

**Ø 12, threaded M12 x 1**

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **4** | NO | Pre-cabled (L = 2 m) *(2)* | **XS6 12B1MAL2** | 0.075 |
| | | Connector 1/2" - 20UNF | **XS6 12B1MAU20** | 0.025 |
| | NC | Pre-cabled (L = 2 m) *(2)* | **XS6 12B1MBL2** | 0.075 |
| | | Connector 1/2" - 20UNF | **XS6 12B1MBU20** | 0.025 |

**Ø 18, threaded M18 x 1**

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **8** | NO | Pre-cabled (L = 2 m) *(2)* | **XS6 18B1MAL2** | 0.120 |
| | | Connector 1/2" - 20UNF | **XS6 18B1MAU20** | 0.060 |
| | NC | Pre-cabled (L = 2 m) *(2)* | **XS6 18B1MBL2** | 0.120 |
| | | Connector 1/2" - 20UNF | **XS6 18B1MBU20** | 0.060 |

**Ø 30, threaded M30 x 1.5**

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **15** | NO | Pre-cabled (L = 2 m) *(2)* | **XS6 30B1MAL2** | 0.205 |
| | | Connector 1/2" - 20UNF | **XS6 30B1MAU20** | 0.145 |
| | NC | Pre-cabled (L = 2 m) *(2)* | **XS6 30B1MBL2** | 0.205 |
| | | Connector 1/2" - 20UNF | **XS6 30B1MBU20** | 0.145 |

**Accessories** *(3)*

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 12 | **XSZ B112** | 0.006 |
| | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

*(1) Available in Ø8 plastic with double insulation, see page 2/42.*
*(2) For a 5 m long cable, replace L2 with **L5**, and for a 10 m long cable, replace L2 with **L10**.*
*Example: XS6 12B1MAL2 becomes **XS6 12B1MAL5** with a 5 m long cable.*
*(3) For further information, see page 2/106.*

# Inductive proximity sensors
## Osiprox® Universal
Cylindrical, flush mountable
Two-wire, a.c. or d.c. supply



## Characteristics

| Sensor type | | | XS6 ●●B1M●U20 | XS6 ●●B1M●L2 |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | |
| **Connection** | Connector | | 1/2" - 20 UNF | – |
| | Pre-cabled | | – | Length: 2 m |
| **Operating zone** | Ø 12 | **mm** | **0…3.2** | |
| | Ø 18 | **mm** | **0…6.4** | |
| | Ø 30 | **mm** | **0…12** | |
| **Differential travel** | | **%** | 1…15 of real sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | IP 68 double insulation ⧈ |
| **Storage temperature range** | | **°C** | - 40…+ 85 | |
| **Operating temperature range** | | **°C** | - 25…+ 70 | |
| **Materials** | Case | | Nickel plated brass | |
| | Pre-cabled | | – | PvR 2 x 0.34 mm² |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Output state indication** | | | LED (yellow): 4 viewing ports at 90° | LED (yellow): annular |
| **Rated supply voltage** | | **V** | ∿ or ⎓ 24…240 (∿ 50/60 Hz) | |
| **Voltage limits (including ripple)** | | **V** | ∿ or ⎓ 20…264 | |
| **Switching capacity** | **XS6 12B1M●●●** | **mA** | 5…200 *(1)* | |
| | **XS6 18B1M●●●, XS6 30B1M●●●** | **mA** | ∿ 5…300 or ⎓ 5…200 *(1)* | |
| **Voltage drop, closed state** | | **V** | ≤ 5.5 | |
| **Residual current, open state** | | **mA** | ≤ 0.8 | |
| **Maximum switching frequency** | **XS6 12B2●●●,XS6 18B1M●●●** | **Hz** | ∿ 25 or ⎓ 1000 | |
| | **XS6 30B1M●●●** | **Hz** | ∿ 25 or ⎓ 500 | |
| **Delays** | First-up | **ms** | ≤ 20 for **XS6 12B1M●●●**, ≤ 25 for **XS6 18B1M●●●** and **XS6 30B1M●●●** | |
| | Response | **ms** | ≤ 0.5 | |
| | Recovery | **ms** | ≤ 0.2 for **XS6 12B1M●●●**, ≤ 0.5 for **XS6 18B1M●●●**, ≤ 2 for **XS6 30B1M●●●** | |

*(1) It is essential to connect a 0.4 A quick-blow fuse in series with the load*

## Wiring scheme

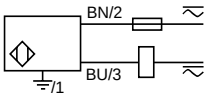
**Connector**

1/2" - 20 UNF


**Pre-cabled**

BU: Blue
BN: Brown

**2-wire ∿ or ⎓**
**N/O or N/C output**

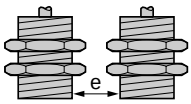


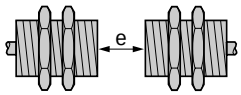

*⏚: on connector models only*

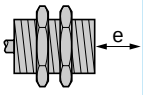
*See connection on page 9/45.*

## Setting-up

**Minimum mounting distances (mm)**



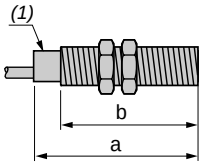




| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 12 | e ≥ 8 | e ≥ 50 | e ≥ 12 |
| Ø 18 | e ≥ 16 | e ≥ 90 | e ≥ 25 |
| Ø 30 | e ≥ 30 | e ≥ 180 | e ≥ 45 |

## Dimensions

**XS6**

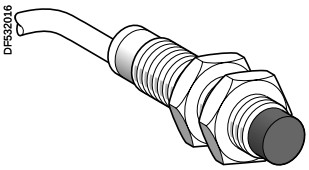



*(1) LED*

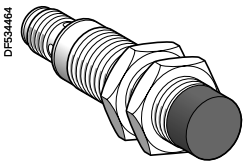
| XS6 | Pre-cabled (mm) | | Connector (mm) | |
|---|---|---|---|---|
| | a | b | a | b |
| Ø 12 | 50 | 42 | 61 | 42 |
| Ø 18 | 60 | 51 | 72.2 | 51 |
| Ø 30 | 60 | 51 | 72.2 | 51 |

# Inductive proximity sensors
## Osiprox® Universal
### Cylindrical, non flush mountable
### Three-wire, d.c. supply, solid-state output

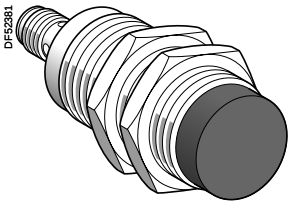




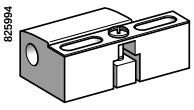

*XS6 ●●B4●●L2*




*XS6 ●●B4●●M12*




*XS6 ●●B4●●M12*




*XSZ B●●●*

### Ø 12, threaded M12 x 1

| Sensing dist. (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **7** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS6 12B4PAL2** | 0.075 |
| | | | M12 connector | **XS6 12B4PAM12** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS6 12B4NAL2** | 0.075 |
| | | | M12 connector | **XS6 12B4NAM12** | 0.020 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS6 12B4PBL2** | 0.075 |
| | | | M12 connector | **XS6 12B4PBM12** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS6 12B4NBL2** | 0.075 |
| | | | M12 connector | **XS6 12B4NBM12** | 0.020 |

### Ø 18, threaded M18 x 1

| Sensing dist. (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **12** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS6 18B4PAL2** | 0.100 |
| | | | M12 connector | **XS6 18B4PAM12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS6 18B4NAL2** | 0.100 |
| | | | M12 connector | **XS6 18B4NAM12** | 0.040 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS6 18B4PBL2** | 0.100 |
| | | | M12 connector | **XS6 18B4PBM12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS6 18B4NBL2** | 0.100 |
| | | | M12 connector | **XS6 18B4NBM12** | 0.040 |

### Ø 30, threaded M30 x 1.5

| Sensing dist. (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **22** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS6 30B4PAL2** | 0.205 |
| | | | M12 connector | **XS6 30B4PAM12** | 0.145 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS6 30B4NAL2** | 0.205 |
| | | | M12 connector | **XS6 30B4NAM12** | 0.145 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS6 30B4PBL2** | 0.205 |
| | | | M12 connector | **XS6 30B4PBM12** | 0.145 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS6 30B4NBL2** | 0.205 |
| | | | M12 connector | **XS6 30B4NBM12** | 0.145 |

### Accessories *(2)*

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 12 | **XSZ B112** | 0.006 |
| | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS6 12B4PAL2** becomes **XS6 12B4PAL5** with a 5 m long cable.*
*(2) For further information, see page 2/106.*

# Inductive proximity sensors
## Osiprox® Universal
Cylindrical, non flush mountable
Three-wire, d.c. supply, solid-state output



## Characteristics

| Sensor type | | | XS6 ●●B4●●M12 | XS6 ●●B4●●L2 |
|---|---|---|---|---|
| **Product certifications/approvals** | | | UL, CSA, CE | |
| **Connection** | Connector | | M12 | – |
| | Pre-cabled | | – | Length: 2 m |
| **Operating zone** | Ø 12 | **mm** | **0…5.6** | |
| | Ø 18 | **mm** | **0…9.6** | |
| | Ø 30 | **mm** | **0…17.6** | |
| **Differential travel** | | **%** | 1...15 of real sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | IP 68, double insulation ⧈ |
| **Storage temperature** | | **°C** | - 40…+ 85 | |
| **Operating temperature** | | **°C** | - 25…+ 70 | |
| **Materials** | Case | | Nickel plated brass | |
| | Cable | | – | PvR, 3 x 0.34 mm² |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Output state indication** | | | Yellow LED: 4 viewing ports at 90° | Yellow LED: annular |
| **Rated supply voltage** | | **V** | ⎓ 12…48 with protection against reverse polarity | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…58 | |
| **Switching capacity** | | **mA** | ⩽ 200 with overload and short-circuit protection | |
| **Voltage drop, closed state** | | **V** | ⩽ 2 | |
| **Current consumption, no-load** | | **mA** | ⩽ 10 | |
| **Maximum switching frequency** | **XS6 12B4●●●●** | **Hz** | 2500 | |
| | **XS6 18B4●●●●** | **Hz** | 1000 | |
| | **XS6 30B4●●●●** | **Hz** | 500 | |
| **Delays** | First-up | **ms** | ⩽ 10 | |
| | Response | **ms** | ⩽ 0.2 Ø12, ⩽ 0.3 Ø18, ⩽ 0.6 Ø30 | |
| | Recovery | **ms** | ⩽ 0.2 Ø12, ⩽ 0.7 Ø18, ⩽ 1.4 Ø30 | |

## Wiring schemes

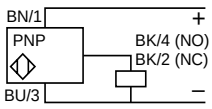
**Connector**

M12

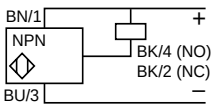

**Pre-cabled**

BU: Blue
BN: Brown
BK: Black

**PNP**

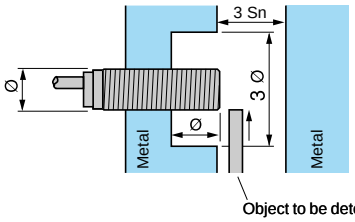



**NPN**

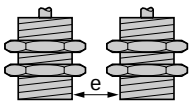


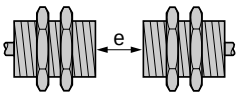

See connection on page 9/45.

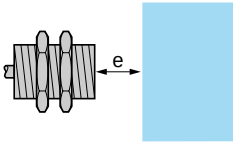
## Setting-up




**Minimum mounting distances (mm)**



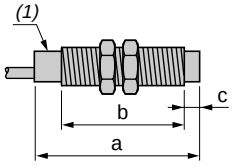




| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 12 | e ⩾ 48 | e ⩾ 84 | e ⩾ 21 |
| Ø 18 | e ⩾ 72 | e ⩾ 144 | e ⩾ 36 |
| Ø 30 | e ⩾ 120 | e ⩾ 264 | e ⩾ 66 |

## Dimensions

**XS6**

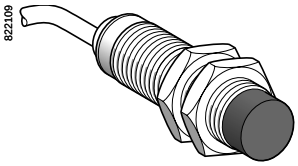



| XS6 | Pre-cabled (mm) | | Connector (mm) | | |
|---|---|---|---|---|---|
| | a | b | a | b | c |
| Ø 12 | 55 | 41.5 | 65.5 | 41.5 | 5 |
| Ø 18 | 60 | 43.5 | 71.5 | 43.5 | 8 |
| Ø 30 | 62.5 | 41 | 74 | 41 | 13 |

*(1) LED*

# Inductive proximity sensors
## Osiprox® Universal
### Cylindrical, non flush mountable
### Two-wire, a.c. or d.c. supply

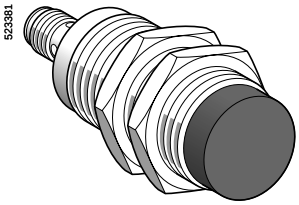





*XS6 ●●B4M●L2*

**Ø 18, threaded M18 x 1**

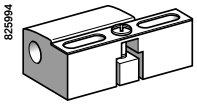
| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **12** | NO | Pre-cabled (L = 2 m) *(1)* | **XS6 18B4MAL2** | 0.120 |
| | | 1/2" - 20UNF connector | **XS6 18B4MAU20** | 0.060 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS6 18B4MBL2** | 0.120 |
| | | 1/2" - 20UNF connector | **XS6 18B4MBU20** | 0.060 |




*XS6 ●●B4M●U20*

**Ø 30, threaded M30 x 1.5**

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **22** | NO | Pre-cabled (L = 2 m) *(1)* | **XS6 30B4MAL2** | 0.205 |
| | | 1/2" - 20UNF connector | **XS6 30B4MAU20** | 0.145 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS6 30B4MBL2** | 0.205 |
| | | 1/2" - 20UNF connector | **XS6 30B4MBU20** | 0.145 |




*XSZ B1●●*

**Accessories** *(2)*

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS6 18B4MAL2** becomes **XS6 18B4MAL5** with a 5 m long cable.*
*(2) For further information, see page 2/106.*

# Inductive proximity sensors
## Osiprox® Universal
Cylindrical, non flush mountable
Two-wire, a.c. or d.c. supply



## Characteristics

| Sensor type | | | XS6 ●●B4M●U20 | XS6 ●●B4M●L2 |
|---|---|---|---|---|
| **Product certifications/approvals** | | | UL, CSA, CE | |
| **Connection** | Connector | | 1/2" - 20UNF | – |
| | Pre-cabled | | – | Length: 2 m |
| **Operating zone** | Ø 18 | **mm** | **0…9.6** | |
| | Ø 30 | **mm** | **0...17.6** | |
| **Differential travel** | | **%** | 1...15 of real sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | IP 68, double insulation ⧈ |
| **Storage temperature** | | **°C** | - 40…+ 85 | |
| **Operating temperature** | | **°C** | - 25…+ 70 | |
| **Materials** | Case | | Nickel plated brass | |
| | Cable | | – | PvR, 2 x 0.34 mm² |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Output state indication** | | | Yellow LED: 4 viewing ports at 90° | Yellow LED: annular |
| **Rated supply voltage** | | **V** | ∿ or ⎓ 24…240 (∿ 50/60 Hz) | |
| **Voltage limits (including ripple)** | | **V** | ∿ or ⎓ 20…264 | |
| **Switching capacity** | | **mA** | ∿ 5…300 or ⎓ 5…200 *(1)* | |
| **Voltage drop, closed state** | | **V** | ⩽ 5.5 | |
| **Residual current, open state** | | **mA** | ⩽ 0.8 | |
| **Maximum switching frequency** | **XS6 18B4M●●●** | **Hz** | ∿ 25 or ⎓ 1000 | |
| | **XS6 30B4M●●●** | **Hz** | ∿ 25 or ⎓ 300 | |
| **Delays** | First-up | **ms** | ⩽ 30 **XS6 18B4M●●●** and **XS6 30B4M●●●** | |
| | Response | **ms** | ⩽ 0.5 | |
| | Recovery | **ms** | ⩽ 0.5 **XS6 18B4M●●●**, ⩽ 2 **XS6 30B4M●●●** | |

*(1) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.*

## Wiring schemes

**Connector**

1/2" - 20UNF


⎓ : 2
⏚ : 1
⎓ : 3

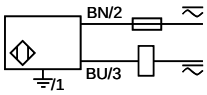
*See connection on page 9/45.*

**Pre-cabled**

BU: Blue
BN: Brown

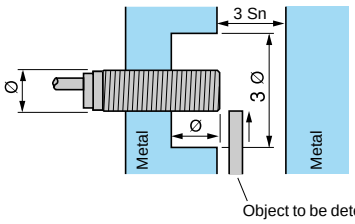
**2-wire ∿ or ⎓**

**NO output**

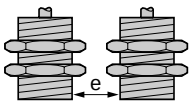


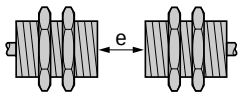

⏚: *on connector models only*

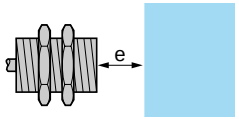
## Setting-up




**Minimum mounting distances (mm)**



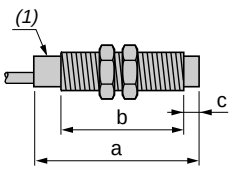




| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 18 | e ⩾ 72 | e ⩾ 144 | e ⩾ 36 |
| Ø 30 | e ⩾ 120 | e ⩾ 264 | e ⩾ 66 |

## Dimensions

**XS6**




*(1) LED*

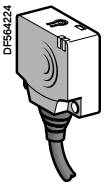
| | Pre-cabled (mm) | | Connector (mm) | | |
|---|---|---|---|---|---|
| **XS6** | **a** | **b** | **a** | **b** | **c** |
| Ø 18 | 60 | 43.5 | 71.5 | 43.5 | 8 |
| Ø 30 | 62.5 | 41 | 74 | 41 | 13 |

# Inductive proximity sensors

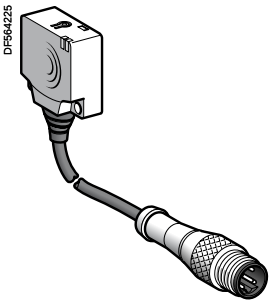
## Osiprox® Universal, Osiconcept® *(1)*

Flat, flush mountable and non flush mountable, forms E, C and D
Two-wire, a.c. or d.c. supply
Three-wire, d.c. supply, solid-state output

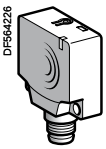




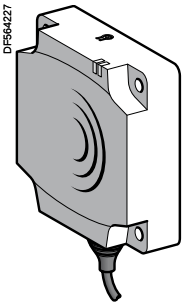

*XS8 E1A1●●L2*



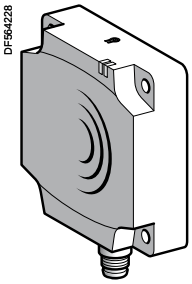

*XS8 ●1A1●●L01M12*
*XS8 ●1A1●●L01U20*



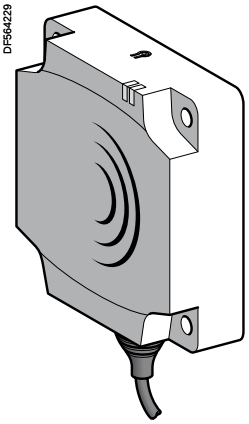

*XS8 E1A1●●M8*



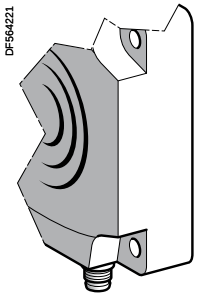

*XS8 C1A1●●L2*



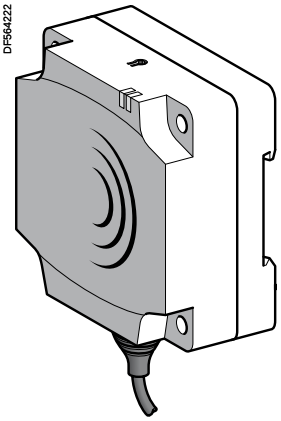

*XS8 C1A1●●M8*



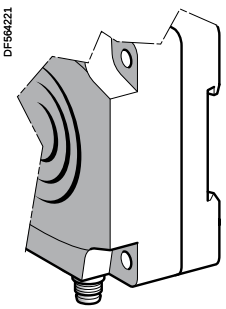

*XS8 D1A1●●L2*




*XS8 D1A1●●M12*




*XS8 D1A1●●L2DIN*




*XS8 D1A1●●M12DIN*

### Flat, form E, 26 x 26 x 13 mm *(2)*

| Sensing dist. (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Three-wire ⎓ with overload and short-circuit protection** | | | | | |
| **15** | NO | PNP | Pre-cabled (L = 2 m) *(3)* | **XS8 E1A1PAL2** | 0.075 |
| | | | M8 connector | **XS8 E1A1PAM8** | 0.040 |
| | | | Remote M12 connector | **XS8 E1A1PAL01M12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS8 E1A1NAL2** | 0.075 |
| | | | M8 connector | **XS8 E1A1NAM8** | 0.040 |
| | | | Remote M12 connector | **XS8 E1A1NAL01M12** | 0.040 |
| | NC | PNP | Pre-cabled (L = 2 m) *(3)* | **XS8 E1A1PBL2** | 0.075 |
| | | | M8 connector | **XS8 E1A1PBM8** | 0.040 |
| | | | Remote M12 connector | **XS8 E1A1PBL01M12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS8 E1A1NBL2** | 0.075 |
| | | | M8 connector | **XS8 E1A1NBM8** | 0.040 |
| | | | Remote M12 connector | **XS8 E1A1NBL01M12** | 0.040 |
| **Two-wire ∿ or ⎓ unprotected** *(4)* | | | | | |
| **15** | NO | – | Pre-cabled (L = 2 m) *(3)* | **XS8 E1A1MAL2** | 0.070 |
| | | | Remote 1/2" - 20 UNF connec. | **XS8 E1A1MAL01U20** | 0.040 |
| | NC | – | Pre-cabled (L = 2 m) *(3)* | **XS8 E1A1MBL2** | 0.070 |
| | | | Remote 1/2" - 20 UNF connec. | **XS8 E1A1MBL01U20** | 0.040 |

### Flat, form C, 40 x 40 x 15 mm *(2)*

| Sensing dist. (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Three-wire ⎓ with overload and short-circuit protection** | | | | | |
| **25** | NO | PNP | Pre-cabled (L = 2 m) *(3)* | **XS8 C1A1PAL2** | 0.095 |
| | | | M8 connector | **XS8 C1A1PAM8** | 0.060 |
| | | | Remote M12 connector | **XS8 C1A1PAL01M12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS8 C1A1NAL2** | 0.095 |
| | | | M8 connector | **XS8 C1A1NAM8** | 0.060 |
| | | | Remote M12 connector | **XS8 C1A1NAL01M12** | 0.060 |
| | NC | PNP | Pre-cabled (L = 2 m) *(3)* | **XS8 C1A1PBL2** | 0.095 |
| | | | M8 connector | **XS8 C1A1PBM8** | 0.060 |
| | | | Remote M12 connector | **XS8 C1A1PBL01M12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS8 C1A1NBL2** | 0.095 |
| | | | M8 connector | **XS8 C1A1NBM8** | 0.060 |
| | | | Remote M12 connector | **XS8 C1A1NBL01M12** | 0.060 |
| **Two-wire ∿ or ⎓ unprotected** *(4)* | | | | | |
| **25** | NO | – | Pre-cabled (L = 2 m) *(3)* | **XS8 C1A1MAL2** | 0.090 |
| | | | Remote 1/2" - 20 UNF connec. | **XS8 C1A1MAL01U20** | 0.060 |
| | NC | – | Pre-cabled (L = 2 m) *(3)* | **XS8 C1A1MBL2** | 0.090 |
| | | | Remote 1/2" - 20 UNF connec. | **XS8 C1A1MBL01U20** | 0.060 |

### Flat, form D, 80 x 80 x 26 mm *(2)*

| Sensing dist. (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Three-wire ⎓ with overload and short-circuit protection** | | | | | |
| **60** | NO | PNP | Pre-cabled (L = 2 m) *(3)* | **XS8 D1A1PAL2** *(5)* | 0.390 |
| | | | M12 connector | **XS8 D1A1PAM12** *(5)* | 0.340 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS8 D1A1NAL2** *(5)* | 0.390 |
| | | | M12 connector | **XS8 D1A1NAM12** *(5)* | 0.340 |
| | NC | PNP | Pre-cabled (L = 2 m) *(3)* | **XS8 D1A1PBL2** *(5)* | 0.390 |
| | | | M12 connector | **XS8 D1A1PBM12** *(5)* | 0.340 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS8 D1A1NBL2** *(5)* | 0.390 |
| | | | M12 connector | **XS8 D1A1NBM12** *(5)* | 0.340 |
| **Two-wire ∿ or ⎓ unprotected** *(4)* | | | | | |
| **60** | NO | – | Pre-cabled (L = 2 m) *(3)* | **XS8 D1A1MAL2** *(5)* | 0.390 |
| | | | 1/2" - 20 UNF connector | **XS8 D1A1MAU20** *(5)* | 0.340 |
| | NC | – | Pre-cabled (L = 2 m) *(3)* | **XS8 D1A1MBL2** *(5)* | 0.390 |
| | | | 1/2" - 20 UNF connector | **XS8 D1A1MBU20** *(5)* | 0.340 |

*(1) For further information on **Osi**concept®, see page 2/20*
*(2) For accessories, see page 2/106.*
*(3) For a 5 m long cable, replace L2 with **L5**, and for a 10 m long cable, replace L2 with **L10**.*
*(4) It is essential to connect a 0.4 A quick-blow fuse in series with the load.*
*(5) For clipping onto 35 mm omega rail or 80 x 80 x 40 mm format, add DIN to the end of the reference. Example: **XS8 D1A1PAL2 DIN**.*

# Inductive proximity sensors

Osiprox® Universal, **Osi**concept® *(1)*

Flat, flush mountable and non flush mountable, forms E, C and D

Two-wire, a.c. or d.c. supply

Three-wire, d.c. supply, solid-state output



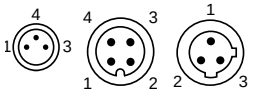
## Characteristics

| Sensor types | | | | XS8 E●●●●●M8, XS8 C●●●●●M8, XS8 D●●●●●M12, XS8 D●●●●●U20 | XS8 E●●●●●L01M12, XS8 E●●●●●L01U20, XS8 C●●●●●L01M12, XS8 C●●●●●L01U20 | XS8 E●●●●●L2, XS8 C●●●●●L2, XS8 D●●●●●L2 |
|---|---|---|---|---|---|---|
| **Product certifications** | | | | UL, CSA, CE | | |
| **Connection** | Connector | | | M8 except XS8 ●●●●●●M12: M12 XS8 ●●●●●●U20: 1/2" 20UNF | 0.15 m flying lead with remote connec. XS8 ●●●●●●L01M12: M12, XS8 ●●●●●●L01U20: 1/2" 20UNF | – |
| | Pre-cabled | | | – | – | Length: 2 m |
| **Sensing distance and adjustment zone** | XS8 E | Nominal sensing dist. Sn | mm | **0…15** non flush mounted configuration / **0…10** flush mounted configuration | | |
| | | Fine adjustment zone | mm | **5…15** non flush mounted configuration / **5…10** flush mounted configuration | | |
| | XS8 C | Nominal sensing dist. Sn | mm | **0…25** non flush mounted configuration / **0…15** flush mounted configuration | | |
| | | Fine adjustment zone | mm | **8…25** non flush mounted configuration / **8…15** flush mounted configuration | | |
| | XS8 D | Nominal sensing dist. Sn | mm | **0…60** non flush mounted configuration / **0…40** flush mounted configuration | | |
| | | Fine adjustment zone | mm | **20…60** non flush mounted configuration / **20…40** flush mounted configuration | | |
| **Differential travel** | | | % | 1…15 of real sensing distance (Sr) | | |
| **Degree of protection** | Conforming to IEC 60529 | | | IP 67 double insulation ⧈ (except for M8 connector: IP 67) | | IP 68 ⧈ |
| **Storage temperature range** | | | °C | - 40….+ 85 | | |
| **Operating temperature range** | | | °C | - 25….+ 70 | | |
| **Materials** | Case | | | PBT | | |
| | Pre-cabled | | | – | PvR 3 x 0.34 mm² ⎓ and PvR 2 x 0.34 mm² ∿ | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | | 50 gn, duration 11 ms | | |
| **Indicator** | Output state | | | Yellow LED | | |
| | Supply on and teach mode | | | Green LED | | |
| **Rated supply voltage** | 3-wire | | V | 12…24 with protection against reverse polarity | | |
| | 2-wire | | V | ∿ or ⎓ 24…240 (∿ 50/60 Hz) | | |
| **Voltage limits (including ripple)** | 3-wire | | V | 10…36 | | |
| | 2-wire | | V | ∿ or ⎓ 20…264 | | |
| **Current consumption, no-load** | 3-wire | | mA | ⩽ 10 | | |
| **Residual current, open state** | 2-wire | | mA | ⩽ 1.5 | | |
| **Switching capacity** | 3-wire | | mA | ⩽ 100 **XS8 E**, ⩽ 200 **XS8 C** and **XS8 D**, with overload and short-circuit protection | | |
| | 2-wire | | mA | 5…200 ⎓ **XS8 E**, 5…300 ∿ **XS8 C** and **XS8 D**, 5…200 ⎓ **XS8 C** and **XS8 D**. | | |
| **Voltage drop, closed state** | 3-wire | | V | ⩽ 2 | | |
| | 2-wire | | V | ⩽ 5.5 | | |
| **Maximum switching frequency** | | | Hz | 2000 **XS8 E**, 1000 **XS8 C**, 150 **XS8 D** | | |
| **Delays** | First-up | | ms | ⩽ 10 **XS8 E**, **XS8 C** and **XS8 D** (3-wire), ⩽ 10 **XS8 E** and **XS8 C**, ⩽ 15 **XS8 D** (2-wire) | | |
| | Response | | ms | ⩽ 0.3 | | |
| | Recovery | | ms | ⩽ 0.8 **XS8 E** and **XS8 C**, ⩽ 6 **XS8 D** | | |

## Wiring scheme

### Connector

M8 M12 1/2" - 20 UNF

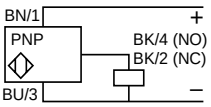



### Pre-cabled

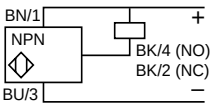
BU: Blue
BN: Brown
BK: Black

*See connection on page 9/45.*

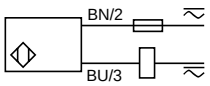
### PNP/M12 or M8




### NPN/M12 or M8




### 2-wire 1/2" - 20 UNF

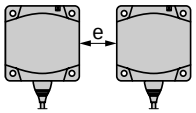



*For M8 connector, NO and NC output on terminal 4.*

## Setting-up

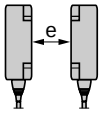
### Minimum mounting distances (mm)

**Side by side**



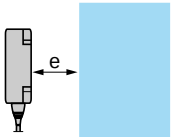

| e ⩾ | XS8 E | XS8 C | XS8 D |
|---|---|---|---|
| Flush mounted | 40 | 60 | 200 |
| Non flush mounted | 150 | 125 | 600 |

**Face to face**




| e ⩾ | XS8 E | XS8 C | XS8 D |
|---|---|---|---|
| Flush mounted | 80 | 120 | 400 |
| Non flush mounted | 300 | 250 | Not recommended |

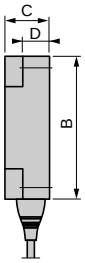
**Facing a metal object**



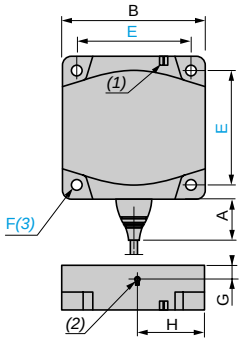

| e ⩾ | XS8 E | XS8 C | XS8 D |
|---|---|---|---|
| | 10 | 15 | 40 |

## Dimensions

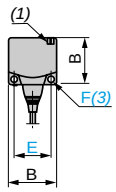
### XS8 C/D/E




### XS8 C/D




### XS8 E




*(1) LED*
*(2) Teach mode button*
*(3) For CHC type screws*

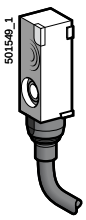
| Sensor | A (cable) | A (connector) | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|---|
| XS8 E | 14 | 11 | 26 | 13 | 8,8 | 20 | 3,5 | 6.8 | 6.6 |
| XS8 C | 14 | 11 | 40 | 15 | 9,8 | 33 | 4,5 | 8.3 | 13.6 |
| XS8 D | 23 | 18 | 80 | 26 | 16 | 65 | 5,5 | 8.5 | 37.8 |
| XS8 D●●DIN | 23 | 18 | 80 | 40 | 30 | 65 | 5.1 | 22.5 | 37.8 |

# Inductive proximity sensors

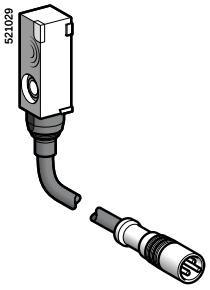
## Osiprox® Optimum

Flat, flush mountable, forms J and F
Two-wire, d.c. supply
Three-wire, d.c. supply, solid-state output

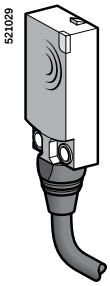




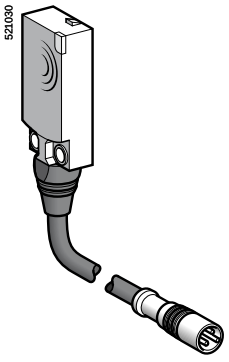

*XS7 J1A1●●L2*




*XS7 J1A1●●L01M8*




*XS7 F1A1●●L2*




*XS7 F1A1●●L01M8*

### Flat, form J, 8 x 22 x 8 mm *(1) (2)*

**Three-wire ⎓**

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) *(3)* | **XS7 J1A1PAL2** | 0.060 |
| | | | 0.15 m flying lead with M8 connector | **XS7 J1A1PAL01M8** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS7 J1A1NAL2** | 0.060 |
| | | | 0.15 m flying lead with M8 connector | **XS7 J1A1NAL01M 8** | 0.040 |
| | NC | PNP | Pre-cabled (L = 2 m) *(3)* | **XS7 J1A1PBL2** | 0.060 |
| | | | 0.15 m flying lead with M8 connector | **XS7 J1A1PBL01M8** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS7 J1A1NBL2** | 0.060 |
| | | | 0.15 m flying lead with M8 connector | **XS7 J1A1NBL01M8** | 0.040 |

**Two-wire ⎓**

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **2.5** | NO | | Pre-cabled (L = 2 m) *(3)* | **XS7 J1A1DAL2** | 0.050 |
| | | | 0.15 m flying lead with M8 connector | **XS7 J1A1DAL01M8** | 0.035 |
| | NC | | Pre-cabled (L = 2 m) *(3)* | **XS7 J1A1DBL2** | 0.050 |
| | | | 0.15 m flying lead with M8 connector | **XS7 J1A1DBL01M8** | 0.035 |

### Flat, form F, 15 x 32 x 8 mm *(1)*

**Three-wire ⎓**

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **5** | NO | PNP | Pre-cabled (L = 2 m) *(3)* | **XS7 F1A1PAL2** | 0.065 |
| | | | 0.15 m flying lead with M8 connector | **XS7 F1A1PAL01M8** | 0.045 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS7 F1A1NAL2** | 0.065 |
| | | | 0.15 m flying lead with M8 connector | **XS7 F1A1NAL01M8** | 0.045 |
| | NC | PNP | Pre-cabled (L = 2 m) *(3)* | **XS7 F1A1PBL2** | 0.065 |
| | | | 0.15 m flying lead with M8 connector | **XS7 F1A1PBL01M8** | 0.045 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS7 F1A1NBL2** | 0.065 |
| | | | 0.15 m flying lead with M8 connector | **XS7 F1A1NBL01M8** | 0.045 |

**Two-wire ⎓**

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **5** | NO | | Pre-cabled (L = 2 m) *(3)* | **XS7 F1A1DAL2** | 0.055 |
| | | | 0.15 m flying lead with M8 connector | **XS7 F1A1DAL01M8** | 0.045 |
| | NC | | Pre-cabled (L = 2 m) *(3)* | **XS7 F1A1DBL2** | 0.055 |
| | | | 0.15 m flying lead with M8 connector | **XS7 F1A1DBL01M8** | 0.045 |

*(1) For accessories, see page 2/106.*
*(2) Sensors **XS7 J** include a basic fixing clamp with screw.*
*(3) For a 5 m long cable, replace L2 with **L5**, and for a 10 m long cable, replace L2 with **L10**. For example XS7 J1A1PAL2 becomes **XS7 J1A1PAL5** with a 5 m long cable.*

# Inductive proximity sensors

## Osiprox® Optimum

Flat, flush mountable, forms J and F
Two-wire, d.c. supply
Three-wire, d.c. supply, solid-state output



## Characteristics

| Sensor type | | | XS7 J●●●●●L01M8 | XS7 F●●●●●L01M8 | XS7 J●●●●●●L2, XS7 F●●●●●●L2 |
|---|---|---|---|---|---|
| **Product certifications** | | | CE | UL, CSA, CE | |
| **Connection** | Connector | | 0.15 m flying lead with M8 connector | | – |
| | Pre-cabled | | – | | Length: 2 m |
| **Operating zone** | **XS7 J** | **mm** | **0…2** | | |
| | **XS7 F** | **mm** | **0…4** | | |
| **Differential travel** | | **%** | 1…15 of real sensing distance (Sr) | | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 (**XS7 J**), IP 68 (**XS7 F**) | | |
| **Storage temperature range** | | **°C** | - 40….+ 85 | | |
| **Operating temperature range** | | **°C** | - 25….+ 70 | | |
| **Materials** | Case | | PBT | | |
| | Pre-cabled | | PvR 3 x 0.11 mm² or 2 x 0.11 mm² (XS7 F : 2 or 3 x 0,34 mm²) | | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | | |
| **Output state indication** | | | Yellow LED | | |
| **Rated supply voltage** | | **V** | ⎓ 12…24 with protection against reverse polarity | | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…36 | | |
| **Current consumption, no-load** | 3-wire | **mA** | ≤ 10 | | |
| **Residual current, open state** | 2-wire | **mA** | ≤ 0.5 | | |
| **Switching capacity** | 3-wire | **mA** | 100 with overload and short-circuit protection | | |
| | 2-wire | **mA** | 1.5...100 with overload and short-circuit protection | | |
| **Voltage drop, closed state** | 3-wire | **V** | ≤ 2 | | |
| | 2-wire | **V** | ≤ 4 | | |
| **Maximum switching frequency** | 3-wire | **kHz** | 2 | | |
| | 2-wire | **kHz** | 4 for **XS7 J,** 5 for **XS7 F** | | |
| **Delays** | First-up | **ms** | Three-wire: 5 | | |
| | | **ms** | Two-wire: 10 **XS7 J**, 5 **XS7 F** | | |
| | Response | **ms** | Three-wire: 0.1 | | |
| | | **ms** | Two-wire: 0.5 **XS7 J**, 5 **XS7 F** | | |
| | Recovery | **ms** | Three-wire: 0.1 | | |
| | | **ms** | Two-wire: 1 **XS7 J**, 5 **XS7 F** | | |

## Wiring scheme

**Connector**

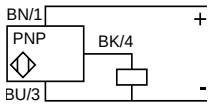
M8


*See connection on page 9/45.*

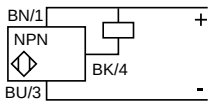
**Pre-cabled**

BU: Blue
BN: Brown
BK: Black

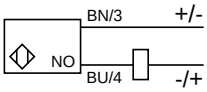
**PNP, NO or NC**



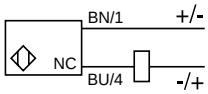

**NPN, NO or NC**




**2-wire, NO**

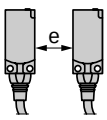


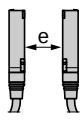

**2-wire, N/C**

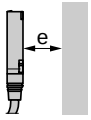



## Setting-up

**Minimum mounting distances (mm)**



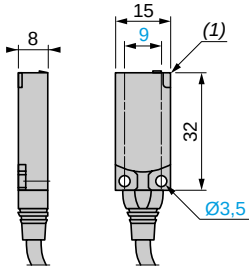



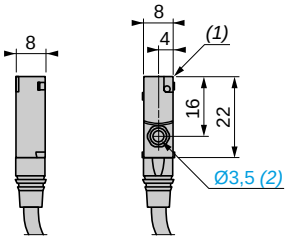

| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| **XS7 J** | e ≥ 1 | e ≥ 6 | e ≥ 7.5 |
| **XS7 F** | e ≥ 1 | e ≥ 12 | e ≥ 15 |

## Dimensions

**XS7 F**




**XS7 J**



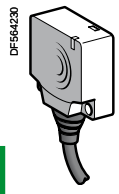

*(1) LED*
*(2) For CHC type screws*

# Inductive proximity sensors

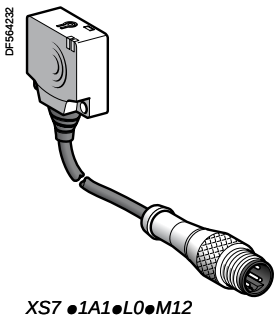
## Osiprox® Optimum

Flat, flush mountable, forms E, C and D
Two-wire, d.c. supply
Three-wire, d.c. supply, solid-state output

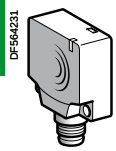




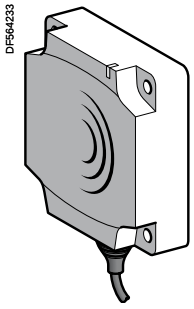

*XS7 E1A1●●L2*



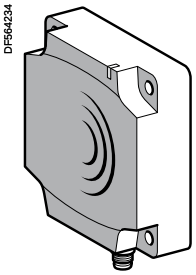

*XS7 ●1A1●L0●M12*



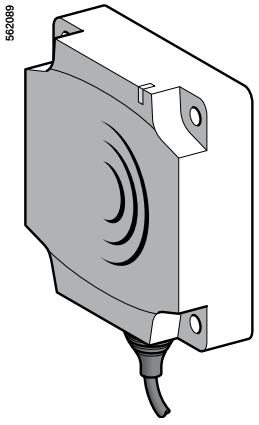

*XS7 E1A1●●M8*



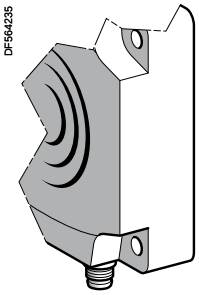

*XS7 C1A1●●L2*



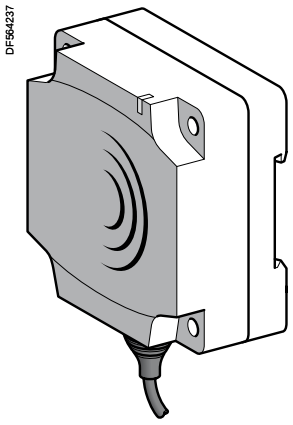

*XS7 C1A1●●M8*



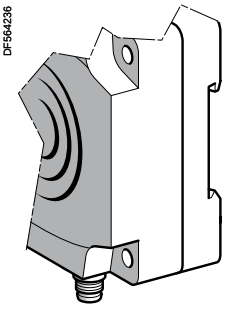

*XS7 D1A1●●L2*




*XS7 D1A1●●M12*




*XS7 D1A1●●L2DIN*




*XS7 D1A1●●M12DIN*

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Flat, form E, 26 x 26 x 13 mm** *(1)* | | | | | |
| **Three-wire** ⎓ | | | | | |
| **10** | NO | PNP | Pre-cabled (L = 2 m) *(4)* | **XS7 E1A1PAL2** | 0.075 |
| | | | M8 connector | **XS7 E1A1PAM8** | 0.040 |
| | | | Remote M12 connector | **XS7 E1A1PAL01M12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(4)* | **XS7 E1A1NAL2** | 0.075 |
| | | | M8 connector | **XS7 E1A1NAM8** | 0.075 |
| | | | Remote M12 connector | **XS7 E1A1NAL01M12** | 0.040 |
| | NC | PNP | Pre-cabled (L = 2 m) *(4)* | **XS7 E1A1PBL2** | 0.075 |
| | | | M8 connector | **XS7 E1A1PBM8** | 0.040 |
| | | | Remote M12 connector | **XS7 E1A1PBL01M12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(4)* | **XS7 E1A1NBL2** | 0.075 |
| | | | M8 connector | **XS7 E1A1NBM8** | 0.040 |
| | | | Remote M12 connector | **XS7 E1A1NBL01M12** | 0.040 |
| **Two-wire** ⎓ | | | | | |
| **10** | NO | | Pre-cabled (L = 2 m) *(4)* | **XS7 E1A1DAL2** | 0.070 |
| | | | M8 connector | **XS7 E1A1DAM8** | 0.040 |
| | | | Remote M12 connector | **XS7 E1A1DAL01M12** | 0.040 |
| | NO terminals 1 and 4 *(2)* | | Remote M12 connector | **XS7 E1A1CAL01M12** | 0.040 |
| | | | Remote M12 connector (3) | **XS7 E1A1CAL08M12** | 0.065 |
| | NC | | Pre-cabled (L = 2 m) *(4)* | **XS7 E1A1DBL2** | 0.070 |
| | | | M8 connector | **XS7 E1A1DBM8** | 0.040 |
| | | | Remote M12 connector | **XS7 E1A1DBL01M12** | 0.040 |
| **Flat, form C, 40 x 40 x 15 mm** *(1)* | | | | | |
| **Three-wire** ⎓ | | | | | |
| **15** | NO | PNP | Pre-cabled (L = 2 m) *(4)* | **XS7 C1A1PAL2** | 0.095 |
| | | | M8 connector | **XS7 C1A1PAM8** | 0.060 |
| | | | Remote M12 connector | **XS7 C1A1PAL01M12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(4)* | **XS7 C1A1NAL2** | 0.095 |
| | | | M8 connector | **XS7 C1A1NAM8** | 0.060 |
| | | | Remote M12 connector | **XS7 C1A1NAL01M12** | 0.060 |
| | NC | PNP | Pre-cabled (L = 2 m) *(4)* | **XS7 C1A1PBL2** | 0.095 |
| | | | M8 connector | **XS7 C1A1PBM8** | 0.060 |
| | | | Remote M12 connector | **XS7 C1A1PBL01M12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(4)* | **XS7 C1A1NBL2** | 0.095 |
| | | | M8 connector | **XS7 C1A1NBM8** | 0.060 |
| | | | Remote M12 connector | **XS7 C1A1NBL01M12** | 0.060 |
| **Two-wire** ⎓ | | | | | |
| **15** | NO | | Pre-cabled (L = 2 m) *(4)* | **XS7 C1A1DAL2** | 0.090 |
| | | | M8 connector | **XS7 C1A1DAM8** | 0.060 |
| | | | Remote M12 connector | **XS7 C1A1DAL01M12** | 0.060 |
| | NO terminals 1 and 4 *(2)* | | Remote M12 connector | **XS7 C1A1CAL01M12** | 0.060 |
| | | | Remote M12 connector *(3)* | **XS7 C1A1CAL08M12** | 0.090 |
| | NC | | Pre-cabled (L = 2 m) *(4)* | **XS7 C1A1DBL2** | 0.090 |
| | | | M8 connector | **XS7 C1A1DBM8** | 0.060 |
| | | | Remote M12 connector | **XS7 C1A1DBL01M12** | 0.060 |
| **Flat, form D, 80 x 80 x 26 mm** *(1)* | | | | | |
| **Three-wire** ⎓ | | | | | |
| **40** | NO | PNP | Pre-cabled (L = 2 m) *(4)* | **XS7 D1A1PAL2** *(5)* | 0,340 |
| | | | M12 connector | **XS7 D1A1PAM12** *(5)* | 0,290 |
| | | NPN | Pre-cabled (L = 2 m) *(4)* | **XS7 D1A1NAL2** *(5)* | 0,340 |
| | | | M12 connector | **XS7 D1A1NAM12** *(5)* | 0,290 |
| | NC | PNP | Pre-cabled (L = 2 m) *(4)* | **XS7 D1A1PBL2** *(5)* | 0,340 |
| | | | M12 connector | **XS7 D1A1PBM12** *(5)* | 0,290 |
| | | NPN | Pre-cabled (L = 2 m) *(4)* | **XS7 D1A1NBL2** *(5)* | 0,340 |
| | | | M12 connector | **XS7 D1A1NBM12** *(5)* | 0,290 |
| **Two-wire** ⎓ | | | | | |
| **40** | NO | | Pre-cabled (L = 2 m) *(4)* | **XS7 D1A1DAL2** *(5)* | 0,340 |
| | | | M12 connector | **XS7 D1A1DAM12** *(5)* | 0,290 |
| | NO terminals 1 and 4 *(2)* | | M12 connector | **XS7 D1A1CAM12** *(5)* | 0,290 |
| | NC | | Pre-cabled (L = 2 m) *(4)* | **XS7 D1A1DBL2** *(5)* | 0,340 |
| | | | M12 connector | **XS7 D1A1DBM12** *(5)* | 0,290 |

*(1) For accessories, see page 2/106.*
*(2) The NO output is connected to terminals 1 and 4 of the M12 connector.*
*(3) 0.8 m flying lead with remote connector.*
*(4) For a 5 m long cable, replace L2 with **L5**, and for a 10 m long cable, replace L2 with **L10**. Example: **XS7 J1A1PAL2** becomes **XS7 J1A1PAL5** with a 5 m long cable.*
*(5) For clipping onto 35 mm omega rail or 80 x 80 x 40 mm format, add DIN to the end of the reference. Example: **XS7 D1A1PAL2** becomes **XS7 D1A1PAL2DIN**.*

# Inductive proximity sensors

Osiprox® Optimum

Flat, flush mountable, forms E, C and D

Two-wire, d.c. supply

Three-wire, d.c. supply, solid-state output



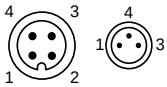
## Characteristics

| Sensor type | | | | XS7 E●●●●●M8, XS7 C●●●●●M8, XS7 D●●●●●M12 | XS7 E●●●●●L01M12, XS7 C●●●●●L01M12 | XS7 E●●●●●L2, XS7 C●●●●●L2, XS7 D●●●●●L2 |
|---|---|---|---|---|---|---|
| **Product certifications** | | | | UL, CSA, CE | | |
| **Connection** | Connector | | | M8 except M12 on **XS7 D●●●●●M12** | 0.15 m flying lead with remote connec., M12 for **XS7 ●●●●●L01M12** | – |
| | Pre-cabled | | | – | – | Length: 2 |
| **Operating zone** | **XS7 E** | | **mm** | **0…8** | | |
| | **XS7 C** | | **mm** | **0…12** | | |
| | **XS7 D** | | **mm** | **0…32** | | |
| **Differential travel** | | | **%** | 1…15 of real sensing distance (Sr) | | |
| **Degree of protection** | Conforming to IEC 60529 | | | IP 67 double insulation ⧈ (except for M8 connector: IP 67) | | IP 68 ⧈ |
| **Storage temperature range** | | | **°C** | - 40….+ 85 | | |
| **Operating temperature range** | | | **°C** | - 25….+ 70 | | |
| **Materials** | Case | | | PBT | | |
| | Pre-cabled | | | – | PvR 3 x 0.34 mm² or 2 x 0.34 mm² | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | | 50 gn, duration 11 ms | | |
| **Output state indication** | | | | Yellow LED | | |
| **Rated supply voltage** | | | **V** | 12…24 with protection against reverse polarity | | |
| **Voltage limits (including ripple)** | | | **V** | 10…36 | | |
| **Current consumption, no-load** | 3-wire | | **mA** | ≤ 10 | | |
| **Residual current, open state** | 2-wire | | **mA** | ≤ 0.5 | | |
| **Switching capacity** | 3-wire | | **mA** | ≤ 100 with overload and short-circuit protection | | |
| | 2-wire | | **mA** | 1.5...100 with overload and short-circuit protection | | |
| **Voltage drop, closed state** | 3-wire | | **V** | ≤ 2 | | |
| | 2-wire | | **V** | ≤ 4 | | |
| **Maximum switching frequency** | **XS7 E, XS7 C** | | **kHz** | 1 | | |
| | **XS7 D** | | **Hz** | 100 | | |
| **Delays** | First-up | 3-wire | **ms** | 10 for **XS7 E** and **XS7 C**, 30 for **XS7 D** | | |
| | | 2-wire | **ms** | 5 for **XS7 E** and **XS7 D**, 10 for **XS7 D** | | |
| | Response | 3-wire | **ms** | 2 for **XS7 E** and **XS7 C**, 5 for **XS7 D** | | |
| | | 2-wire | **ms** | 0.3 for **XS7 E** and **XS7 D**, 10 for **XS7 D** | | |
| | Recovery | 3-wire | **ms** | 6 for **XS7 E**, 5 **XS7 C**, 35 for **XS7 D** | | |
| | | 2-wire | **ms** | 0.7 for **XS7 E** and **XS7 D**, 10 for **XS7 D** | | |

## Wiring scheme

### Connector

M12 M8

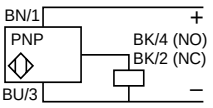



*See connection on page 9/45.*

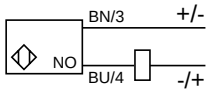
### Pre-cabled

BU: Blue
BN: Brown
BK: Black

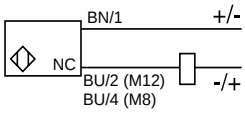
### PNP/M12 or M8



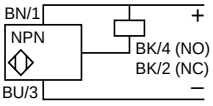

### 2-wire, NO / M12 or M8



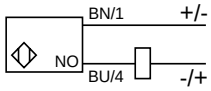

### 2-wire, NC / M12 or M8




### NPN/M12 or M8




### 2-wire, NO/M12 XS7 ●●●●CA●●●

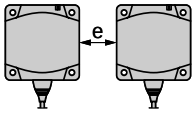



*For M8 connector, NO and NC output on terminal 4.*

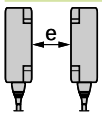
## Setting-up

### Minimum mounting distances (mm)

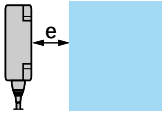
| Side by side | e ≥ | XS7 E | XS7 C | XS7 D |
|---|---|---|---|---|
| | | 4 | 5 | 40 |




| Face to face | e ≥ | XS7 E | XS7 C | XS7 D |
|---|---|---|---|---|
| | | 72 | 110 | 300 |

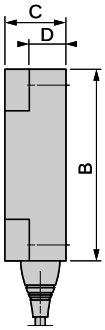



| Facing a metal object | e ≥ | XS7 E | XS7 C | XS7 D |
|---|---|---|---|---|
| | | 30 | 45 | 120 |

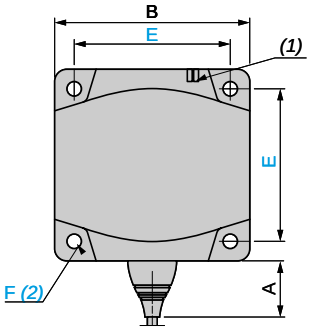



## Dimensions

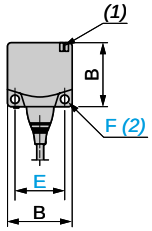
### XS7 C/D/E




### XS7 C/D




### XS7 E




*(1) LED*
*(2) For CHC type screws*

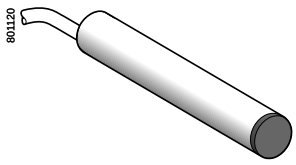
| Sensor | A (cable) | A (connector) | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| **XS7 E** | 14 | 11 | 26 | 13 | 8,8 | **20** | **3.5** |
| **XS7 C** | 14 | 11 | 40 | 15 | 9,8 | **33** | **4.5** |
| **XS7 D** | 23 | 18 | 80 | 26 | 16 | **65** | **5.5** |
| **XS7 D●●DIN** | 23 | 18 | 80 | 40 | 30 | **65** | **5.1** |

# Inductive proximity sensors

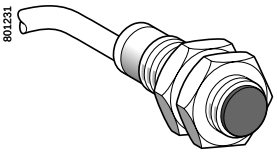
## Osiprox® Optimum

Cylindrical, flush mountable, increased range
Three-wire, d.c. supply, solid-state output

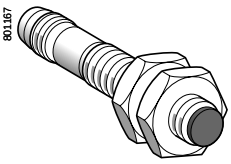




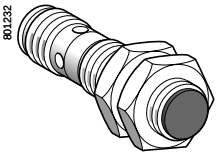

*XS1 L06●A349*



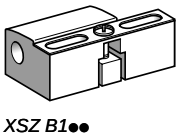

*XS1 N●●●●349*




*XS1 N08●●349S*




*XS1 N●●●●349D*



*XSZ B1●●*

| Sensing distance Sn (mm) | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Ø 6.5, plain** | | | | | |
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) | **XS1 L06PA349** | 0.025 |
| | | | M8 connector | **XS1 L06PA349S** | 0.010 |
| | | | M12 connector | **XS1 L06PA349D** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 L06NA349** | 0.025 |
| | | | M8 connector | **XS1 L06NA349S** | 0.010 |
| | | | M12 connector | **XS1 L06NA349D** | 0.015 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1 L06PB349** | 0.025 |
| | | | M8 connector | **XS1 L06PB349S** | 0.010 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 L06NB349** | 0.025 |
| | | | M8 connector | **XS1 L06NB349S** | 0.010 |
| **Ø 8, threaded M8 x 1** | | | | | |
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) | **XS1 N08PA349** | 0.035 |
| | | | M8 connector | **XS1 N08PA349S** | 0.015 |
| | | | M12 connector | **XS1 N08PA349D** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 N08NA349** | 0.035 |
| | | | M8 connector | **XS1 N08NA349S** | 0.015 |
| | | | M12 connector | **XS1 N08NA349D** | 0.020 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1 N08PB349** | 0.035 |
| | | | M8 connector | **XS1 N08PB349S** | 0.015 |
| | | | M12 connector | **XS1 N08PB349D** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 N08NB349** | 0.035 |
| | | | M8 connector | **XS1 N08NB349S** | 0.015 |
| | | | M12 connector | **XS1 N08NB349D** | 0.020 |
| **Ø 12, threaded M12 x 1** | | | | | |
| **4** | NO | PNP | Pre-cabled (L = 2 m) | **XS1 N12PA349** | 0.070 |
| | | | M12 connector | **XS1 N12PA349D** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 N12NA349** | 0.070 |
| | | | M12 connector | **XS1 N12NA349D** | 0.020 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1 N12PB349** | 0.070 |
| | | | M12 connector | **XS1 N12PB349D** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 N12NB349** | 0.070 |
| | | | M12 connector | **XS1 N12NB349D** | 0.020 |
| **Ø 18, threaded M18 x 1** | | | | | |
| **10** | NO | PNP | Pre-cabled (L = 2 m) | **XS1 N18PA349** | 0.100 |
| | | | M12 connector | **XS1 N18PA349D** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 N18NA349** | 0.100 |
| | | | M12 connector | **XS1 N18NA349D** | 0.040 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1 N18PB349** | 0.100 |
| | | | M12 connector | **XS1 N18PB349D** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 N18NB349** | 0.100 |
| | | | M12 connector | **XS1 N18NB349D** | 0.040 |
| **Ø 30, threaded M30 x 1.5** | | | | | |
| **20** | NO | PNP | Pre-cabled (L = 2 m) | **XS1 N30PA349** | 0.160 |
| | | | M12 connector | **XS1 N30PA349D** | 0.100 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 N30NA349** | 0.160 |
| | | | M12 connector | **XS1 N30NA349D** | 0.100 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1 N30PB349** | 0.160 |
| | | | M12 connector | **XS1 N30PB349D** | 0.100 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 N30NB349** | 0.160 |
| | | | M12 connector | **XS1 N30NB349D** | 0.100 |

## Accessories *(1)*

| Description mm | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 8 | **XSZ B108** | 0.006 |
| | Ø 12 | **XSZ B112** | 0.006 |
| | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

*(1) For further information, see page 2/106.*

# Inductive proximity sensors
## Osiprox® Optimum
Cylindrical, flush mountable, increased range
Three-wire, d.c. supply, solid-state output



## Characteristics

| Sensor type | | | XS1 ●●●●●349D | XS1 ●●●●●349S | XS1 ●●●●●349 |
|---|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | | |
| **Connection** | | | M12 connector | M8 connector | Pre-cabled, length: 2 m |
| **Operating zone** | Ø 6.5 and Ø 8 | **mm** | **0…2** | | |
| | Ø 12 | **mm** | **0…3.2** | | |
| | Ø 18 | **mm** | **0…8** | | |
| | Ø 30 | **mm** | **0…16** | | |
| **Differential travel** | | **%** | 1...15 of real sensing distance (Sr) | | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | | IP 68, double insulation (except Ø 6.5 and Ø 8: IP 67) |
| | Conforming to DIN 40050 | | IP 69K from Ø 12 to Ø 30 | | |
| **Storage temperature** | | **°C** | - 40…+ 85 | | |
| **Operating temperature** | | **°C** | - 25…+ 70 | | |
| **Materials** | Case | | Nickel plated brass | | |
| | Cable | | – | | PvR 3 x 0.34 mm² except Ø 6.5 and Ø 8: 3 x 0.11 mm² |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | | |
| **Output state indication** | | | Yellow LED, 4 viewing ports at 90° | | Yellow LED, annular |
| **Rated supply voltage** | | **V** | ⎓ 12…24 with protection against reverse polarity | | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…36 | | |
| **Switching capacity** | | **mA** | ≤ 200 with overload and short-circuit protection | | |
| **Voltage drop, closed state** | | **V** | ≤ 2 | | |
| **Current consumption, no-load** | | **mA** | ≤ 10 | | |
| **Maximum switching frequency** | Ø 6.5, Ø 8 and Ø 12 | **Hz** | 2500 | | |
| | Ø 18 | **Hz** | 1000 | | |
| | Ø 30 | **Hz** | 500 | | |
| **Delays** | First-up | **ms** | ≤ 5 | | |
| | Response | **ms** | ≤ 0.2 for Ø 8 and Ø 12, ≤ 0.3 for Ø 18, ≤ 0.6 for Ø 30 | | |
| | Recovery | **ms** | ≤ 0.2 for Ø 8 and Ø 12, ≤ 0.7 for Ø 18, ≤ 1.4 for Ø 30 | | |

## Wiring schemes

**Connector**

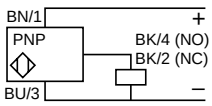
M8


M12

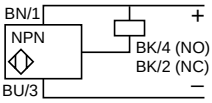

**Pre-cabled**

BU: Blue
BN: Brown
BK: Black

**PNP 3-wire**




**NPN 3-wire**

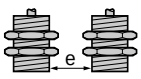


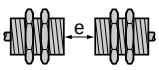

*See connection on page* 9/45.

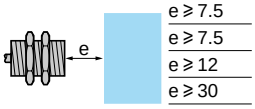
## Setting-up

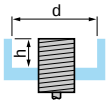
**Minimum mounting distances (mm)**

| Sensor | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| Ø 6.5 | e ≥ 5 | e ≥ 30 | e ≥ 7.5 | d ≥ 10 h ≥ 1.6 |
| Ø 8 | e ≥ 5 | e ≥ 30 | e ≥ 7.5 | d ≥ 10 h ≥ 1.6 |
| Ø 12 | e ≥ 8 | e ≥ 48 | e ≥ 12 | d ≥ 14 h ≥ 2.4 |
| Ø 18 | e ≥ 20 | e ≥ 96 | e ≥ 30 | d ≥ 28 h ≥ 3.6 |
| Ø 30 | e ≥ 40 | e ≥ 240 | e ≥ 60 | d ≥ 50 h ≥ 6 |

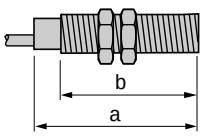



## Dimensions



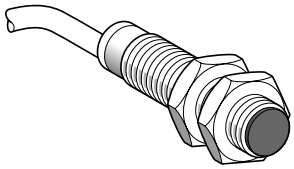

**Flush mountable in metal**

| Sensor | Pre-cabled | | M8 connector | | M12 connector | |
|---|---|---|---|---|---|---|
| | a | b | a | b | a | b |
| Ø 6.5 | 33 | 30 | 42 | 34 | 45 | 24 |
| Ø 8 | 33 | 25 | 42 | 26 | 45 | 23 |
| Ø 12 | 35 | 25 | – | – | 50 | 29 |
| Ø 18 | 38 | 28 | – | – | 50.3 | 28 |
| Ø 30 | 42.3 | 32 | – | – | 54.5 | 32 |

# Inductive proximity sensors
## Osiprox® Optimum
### Cylindrical, flush mountable
### Three-wire, d.c. supply, solid-state output

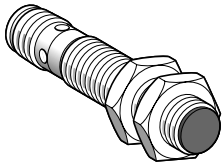


801267



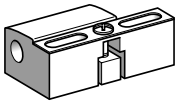
*XS5 ●●B1●●L2*

801268



*XS5 ●●B1●●M12*

825994



*XSZ B1●●*

## Ø 8, threaded M8 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **1.5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS5 08B1PAL2** | 0.035 |
| | | | M8 connector | **XS5 08B1PAM8** | 0.025 |
| | | | M12 connector | **XS5 08B1PAM12** | 0,025 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS5 08B1NAL2** | 0.035 |
| | | | M8 connector | **XS5 08B1NAM8** | 0.025 |
| | | | M12 connector | **XS5 08B1NAM12** | 0.025 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS5 08B1PBL2** | 0.035 |
| | | | M8 connector | **XS5 08B1PBM8** | 0.025 |
| | | | M12 connector | **XS5 08B1PBM12** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS5 08B1NBL2** | 0.035 |
| | | | M8 connector | **XS5 08B1NBM8** | 0.025 |
| | | | M12 connector | **XS5 08B1NBM12** | 0.025 |

## Ø 12, threaded M12 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **2** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS5 12B1PAL2** | 0.075 |
| | | | M12 connector | **XS5 12B1PAM12** | 0.035 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS5 12B1NAL2** | 0.075 |
| | | | M12 connector | **XS5 12B1NAM12** | 0.035 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS5 12B1PBL2** | 0.075 |
| | | | M12 connector | **XS5 12B1PBM12** | 0.035 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS5 12B1NBL2** | 0.075 |
| | | | M12 connector | **XS5 12B1NBM12** | 0.035 |

## Ø 18, threaded M18 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS5 18B1PAL2** | 0.120 |
| | | | M12 connector | **XS5 18B1PAM12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS5 18B1NAL2** | 0.120 |
| | | | M12 connector | **XS5 18B1NAM12** | 0.060 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS5 18B1PBL2** | 0.120 |
| | | | M12 connector | **XS5 18B1PBM12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS5 18B1NBL2** | 0.120 |
| | | | M12 connector | **XS5 18B1NBM12** | 0.060 |

## Ø 30, threaded M30 x 1.5

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **10** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS5 30B1PAL2** | 0.205 |
| | | | M12 connector | **XS5 30B1PAM12** | 0.145 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS5 30B1NAL2** | 0.205 |
| | | | M12 connector | **XS5 30B1NAM12** | 0.145 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS5 30B1PBL2** | 0.205 |
| | | | M12 connector | **XS5 30B1PBM12** | 0.145 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS5 30B1NBL2** | 0.205 |
| | | | M12 connector | **XS5 30B1NBM12** | 0.145 |

## Accessories *(2)*

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 8 | **XSZ B108** | 0.006 |
| | Ø 12 | **XSZ B112** | 0.006 |
| | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

*(1) For a 5 m long cable, replace L2 with **L5**, and for a 10 m long cable, replace L2 with **L10**.*
*Example: XS5 08B1PAL2 becomes **XS5 08B1PAL5** with a 5 m long cable.*
*(2) For further information, see page 2/106.*

# Inductive proximity sensors
## Osiprox® Optimum
Cylindrical, flush mountable
Three-wire, d.c. supply, solid-state output



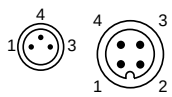
## Characteristics

| Sensor type | | | XS5 ●●B1●●M8, XS5 ●●B1●●M12 | XS5 ●●B1●●L2 |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | |
| **Connection** | Connector | | M8 on Ø 8,<br>M12 on Ø 8, M12 on Ø 12, Ø 18 and Ø 30 | – |
| | Pre-cabled | | – | Length: 2 m |
| **Operating zone** | Ø 8 | **mm** | **0…1.2** | |
| | Ø 12 | **mm** | **0…1.6** | |
| | Ø 18 | **mm** | **0…4** | |
| | Ø 30 | **mm** | **0…8** | |
| **Differential travel** | | **%** | 1…15 of real sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | IP 68 ⧈ (except Ø 8: IP 67) |
| | Conforming to DIN 40050 | | IP 69K for Ø12 to Ø30 | |
| **Storage temperature range** | | **°C** | - 40…+ 85 | |
| **Operating temperature range** | | **°C** | - 25…+ 70 | |
| **Materials** | Case | | Nickel plated brass | |
| | Pre-cabled | | – | PvR 3 x 0.34 mm² (except **XS5 08**: 3 x 0.11 mm²) |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 50 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Output state indication** | | | LED (yellow): 4 viewing ports at 90° | LED (yellow): annular |
| **Rated supply voltage** | | **V** | ⎓ 12…24 with protection against reverse polarity | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…36 | |
| **Switching capacity** | | **mA** | ≤ 200 with overload and short-circuit protection | |
| **Voltage drop, closed state** | | **V** | ≤ 2 | |
| **Current consumption, no-load** | | **mA** | ≤ 10 | |
| **Maximum switching frequency** | **XS5 08B1●●●●, XS5 12B1●●●●** | **kHz** | 5 | |
| | **XS5 18B1●●●●** | **kHz** | 2 | |
| | **XS5 30B1●●●●** | **kHz** | 1 | |
| **Delays** | First-up | **ms** | ≤ 10 | |
| | Response | **ms** | ≤ 0.1 for **XS5 08B1●●●●** and **XS5 12B1●●●●**, ≤ 0.15 for **XS5 18B1●●●●**, ≤ 0.3 for **XS5 30B1●●●●** | |
| | Recovery | **ms** | ≤ 0.1 for **XS5 08B1●●●●** and **XS5 12B1●●●●**, ≤ 0.35 for **XS5 18B1●●●●**, ≤ 0.7 for **XS5 30B1●●●●** | |

## Wiring scheme

**Connector**

M8 M12

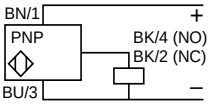



*See connection on page 9/45.*

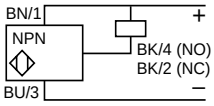
**Pre-cabled**

BU: Blue
BN: Brown
BK: Black

**PNP**



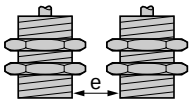

**NPN**

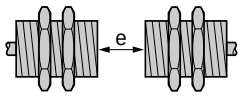


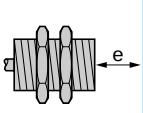

*For M8 connector, NO and NC output on terminal 4.*

## Setting-up

**Minimum mounting distances (mm)**



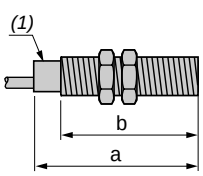




| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 8 | e ≥ 3 | e ≥ 18 | e ≥ 4.5 |
| Ø 12 | e ≥ 4 | e ≥ 24 | e ≥ 6 |
| Ø 18 | e ≥ 10 | e ≥ 60 | e ≥ 15 |
| Ø 30 | e ≥ 20 | e ≥ 120 | e ≥ 30 |

## Dimensions

**XS5**

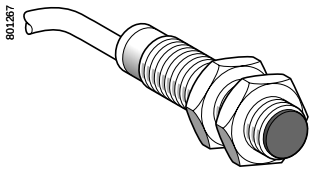



*(1) LED*

| XS5 | Pre-cabled a | Pre-cabled b | Connector | Connector a | Connector b |
|---|---|---|---|---|---|
| Ø 8 | 33 | 25 | M8 | 42 | 26 |
| | | | M12 | 45 | 24 |
| Ø 12 | 35 | 25 | M12 | 50 | 29 |
| Ø 18 | 38 | 28 | M12 | 50.3 | 28 |
| Ø 30 | 42.3 | 32 | M12 | 54.5 | 32 |

# Inductive proximity sensors
## Osiprox® Optimum
## Cylindrical, flush mountable
## Two-wire, d.c. supply

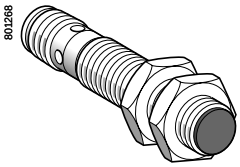





*XS5 ●●B1D●L2*

### Ø 8, threaded M8 x 1

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **1.5** | NO | Pre-cabled (L = 2 m) *(1)* | **XS5 08B1DAL2** | 0.035 |
| | | M12 connector | **XS5 08B1DAM12** | 0.025 |
| | NO terminals 1 and 4 *(2)* | M12 connector | **XS5 08B1CAM12** | 0.025 |
| | | Remote M12 connector *(3)* | **XS5 08B1CAL08M12** | 0.050 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS5 08B1DBL2** | 0.035 |
| | | M12 connector | **XS5 08B1DBM12** | 0.025 |




*XS5 ●●B1D●M12*

### Ø 12, threaded M12 x 1

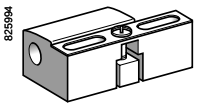
| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **2** | NO | Pre-cabled (L = 2 m) *(1)* | **XS5 12B1DAL2** | 0.075 |
| | | M12 connector | **XS5 12B1DAM12** | 0.035 |
| | NO terminals 1 and 4 *(2)* | M12 connector | **XS5 12B1CAM12** | 0.035 |
| | | Remote M12 connector *(3)* | **XS5 12B1CAL08M12** | 0.060 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS5 12B1DBL2** | 0.075 |
| | | M12 connector | **XS5 12B1DBM12** | 0.035 |

### Ø 18, threaded M18 x 1

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **5** | NO | Pre-cabled (L = 2 m) *(1)* | **XS5 18B1DAL2** | 0.120 |
| | | M12 connector | **XS5 18B1DAM12** | 0.060 |
| | NO terminals 1 and 4 *(2)* | M12 connector | **XS5 18B1CAM12** | 0.060 |
| | | Remote M12 connector *(3)* | **XS5 18B1CAL08M12** | 0.085 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS5 18B1DBL2** | 0.120 |
| | | M12 connector | **XS5 18B1DBM12** | 0.060 |

### Ø 30, threaded M30 x 1.5

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **10** | NO | Pre-cabled (L = 2 m) *(1)* | **XS5 30B1DAL2** | 0.205 |
| | | M12 connector | **XS5 30B1DAM12** | 0.145 |
| | NO terminals 1 and 4 *(2)* | M12 connector | **XS5 30B1CAM12** | 0.145 |
| | | Remote M12 connector *(3)* | **XS5 30B1CAL08M12** | 0.170 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS5 30B1DBL2** | 0.205 |
| | | M12 connector | **XS5 30B1DBM12** | 0.145 |




*XSZ B1●●*

### Accessories *(4)*

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 8 | **XSZ B108** | 0.006 |
| | Ø 12 | **XSZ B112** | 0.006 |
| | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: XS5 08B1DAL2 becomes **XS5 08B1DAL5** with a 5 m long cable.*
*(2) The NO output is connected to terminals 1 and 4 of the M12 connector.*
*(3) 0.8 m flying lead with M12 connector.*
*(4) For further information, see page 2/106.*

# Inductive proximity sensors
## Osiprox® Optimum
Cylindrical, flush mountable
Two-wire, d.c. supply



## Characteristics

| Sensor type | | | XS5 ●●B1●●M12 | XS5 ●●B1CAL08M12 | XS5 ●●B1D●L2 |
|---|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | | |
| **Connection** | Connector | | M12 | 0.80 m flying lead with M12 connector | – |
| | Pre-cabled | | – | | Length: 2 m |
| **Operating zone** | Ø 8 | **mm** | **0…1.2** | | |
| | Ø 12 | **mm** | **0…1.6** | | |
| | Ø 18 | **mm** | **0…4** | | |
| | Ø 30 | **mm** | **0…8** | | |
| **Differential travel** | | **%** | 1...15 of real sensing distance (Sr) | | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | | ⧈ IP 68 (except Ø 8: IP 67) |
| **Storage temperature** | | **°C** | - 40…+ 85 | | |
| **Operating temperature** | | **°C** | - 25…+ 70 | | |
| **Materials** | Case | | Nickel plated brass (except **XS5 08**: stainless steel, grade 303) | | |
| | Cable | | – | PvR 2 x 0.34 mm² (except **XS5 08**: 2 x 0.11 mm²) | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | | |
| **Output state indication** | | | Yellow LED: 4 viewing ports at 90° | | Yellow LED: annular |
| **Rated supply voltage** | | **V** | ⎓ 12…48 | | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…58 | | |
| **Switching capacity** | | **mA** | 1.5…100 with overload and short-circuit protection | | |
| **Voltage drop, closed state** | | **V** | ≤ 4 | | |
| **Residual current, open state** | | **mA** | ≤ 0.5 | | |
| **Maximum switching frequency** | **XS5 08B1D●●●, XS5 12B1D●●●** | **Hz** | 4000 | | |
| | **XS5 18B1D●●●** | **Hz** | 3000 | | |
| | **XS5 30B1D●●●** | **Hz** | 2000 | | |
| **Delays** | First-up | **ms** | ≤ 10 | | |
| | Response | **ms** | ≤ 0.2 **XS5 08B1●●●●** and **XS5 12B1●●●●**,<br>≤ 0.15 **XS5 18B1●●●●**,<br>≤ 0.3 **XS5 30B1●●●●** | | |
| | Recovery | **ms** | ≤ 0.2 (except **XS5 30B1●●●●**: ≤ 0.3) | | |

## Wiring schemes

### Connector

M12

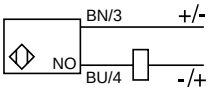

*See connection on page 9/44.*

### Pre-cabled

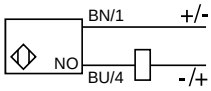
BU: Blue
BN: Brown

### 2-wire ⎓ non polarised
**NO output**

**XS5 ●●B1DA●●●**

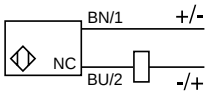



**XS5 ●●B1CA●●●**



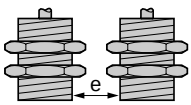

### 2-wire ⎓ non polarised
**NC output**

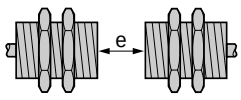
**XS5 ●●B1DB●●●**

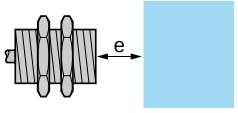



## Setting-up

**Minimum mounting distances (mm)**



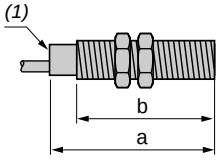




| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 8 | e ≥ 3 | e ≥ 18 | e ≥ 4.5 |
| Ø 12 | e ≥ 4 | e ≥ 24 | e ≥ 6 |
| Ø 18 | e ≥ 10 | e ≥ 60 | e ≥ 15 |
| Ø 30 | e ≥ 20 | e ≥ 120 | e ≥ 30 |

## Dimensions

### XS5




*(1) LED*

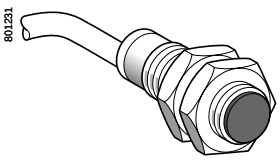
| | Pre-cabled (mm) | | Connector (mm) | |
|---|---|---|---|---|
| | a | b | a | b |
| Ø 8 | 50 | 42 | 61 | 40 |
| Ø 12 | 50 | 42 | 61 | 42 |
| Ø 18 | 52.5 | 44 | 64.6 | 44 |
| Ø 30 | 50 | 42 | 62.2 | 41 |

# Inductive proximity sensors

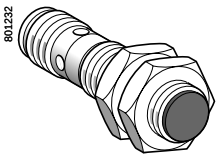
## Osiprox® Technology

Plastic, cylindrical, non flush mountable
Two-wire, a.c. or d.c. supply
Three-wire, d.c. supply, solid-state output

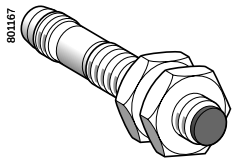





*XS4 P●●●●340*
*XS4 P●●●●370*
*XS4 P●●●●230*




*XS4 P●●●●340D*
*XS4 P●●●●370D*
*XS4 P●●●●230D*




*XS4 P●●●●340S*

| Sensing dist. Sn (mm) | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Ø 8, threaded M8 x 1** | | | | | |
| **Three-wire ⎓ 12-24 V** | | | | | |
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) *(1) (2)* | **XS4 P08PA340** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (2)* | **XS4 P08NA340** | 0.025 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1) (2)* | **XS4 P08PB340** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (2)* | **XS4 P08NB340** | 0.025 |
| **Three-wire ⎓ 12-48 V** | | | | | |
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS4 P08PA370** | 0.030 |
| | | NPN | Pre-cabled (L = 2 m) | **XS4 P08NA370** | 0.030 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS4 P08PB370** | 0.030 |
| | | NPN | Pre-cabled (L = 2 m) | **XS4 P08NB370** | 0.030 |
| **Two-wire ∿ or ⎓ 24-240 V** | | | | | |
| **2.5** | NO | | Pre-cabled (L = 2 m) *(1)* | **XS4 P08MA230** | 0.030 |
| | | | 1/2"-20UNF connector | **XS4 P08MA230K** | 0.020 |
| | NC | | Pre-cabled (L = 2 m) *(1)* | **XS4 P08MB230** | 0.030 |
| | | | 1/2"-20UNF connector | **XS4 P08MB230K** | 0.020 |
| **Ø 12, threaded M12 x 1** | | | | | |
| **Three-wire ⎓ 12-24 V** | | | | | |
| **4** | NO | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P12PA340** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P12NA340** | 0.060 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P12PB340** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P12NB340** | 0.060 |
| **Three-wire ⎓ 12-48 V** | | | | | |
| **4** | NO | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P12PA370** | 0.065 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P12NA370** | 0.065 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P12PB370** | 0.065 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS4 P12NB370** | 0.065 |
| **Two-wire ∿ or ⎓ 24-240 V** | | | | | |
| **4** | NO | | Pre-cabled (L = 2 m) *(1)* | **XS4 P12MA230** | 0.065 |
| | | | 1/2"-20UNF connector | **XS4 P12MA230K** | 0.030 |
| | NC | | Pre-cabled (L = 2 m) *(1)* | **XS4 P12MB230** | 0.065 |
| | | | 1/2"-20UNF connector | **XS4 P12MB230K** | 0.030 |
| **Ø 18, threaded M18 x 1** | | | | | |
| **Three-wire ⎓ 12-24 V** | | | | | |
| **8** | NO | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P18PA340** | 0.090 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P18NA340** | 0.090 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P18PB340** | 0.090 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P18NB340** | 0.090 |
| **Three-wire ⎓ 12-48 V** | | | | | |
| **8** | NO | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P18PA370** | 0.100 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P18NA370** | 0.100 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P18PB370** | 0.100 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS4 P18NB370** | 0.100 |
| **Two-wire ∿ or ⎓ 24-240 V** | | | | | |
| **8** | NO | | Pre-cabled (L = 2 m) *(1)* | **XS4 P18MA230** | 0.100 |
| | | | 1/2"-20UNF connector | **XS4 P18MA230K** | 0.040 |
| | NC | | Pre-cabled (L = 2 m) *(1)* | **XS4 P18MB230** | 0.100 |
| | | | 1/2"-20UNF connector | **XS4 P18MB230K** | 0.040 |
| **Ø 30, threaded M30 x 1.5** | | | | | |
| **Three-wire ⎓ 12-24 V** | | | | | |
| **15** | NO | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P30PA340** | 0.120 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P30NA340** | 0.120 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P30PB340** | 0.120 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P30NB340** | 0.120 |
| **Three-wire ⎓ 12-48 V** | | | | | |
| **15** | NO | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P30PA370** | 0.140 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4 P30NA370** | 0.140 |
| | NC | PNP | Pre-cabled (L = 2 m) *(3)* | **XS4 P30PB370** | 0.140 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS4 P30NB370** | 0.140 |
| **Two-wire ∿ or ⎓** | | | | | |
| **15** | NO | | Pre-cabled (L = 2 m) *(1)* | **XS4 P30MA230** | 0.140 |
| | | | 1/2"-20UNF connector | **XS4 P30MA230K** | 0.080 |
| | NC | | Pre-cabled (L = 2 m) *(1)* | **XS4 P30MB230** | 0.140 |
| | | | 1/2"-20UNF connector | **XS4 P30MB230K** | 0.080 |

*(1) For a 5 m long cable, add **L1** to the reference and for a 10 m long cable, add **L2**. Example: **XS4 P08PA340** becomes **XS4 P08PA340L1** with a 5 m long cable.*
*(2) For an M8 connector, add **S** to the reference. Example: **XS4 P08PA340** becomes **XS4 P08PA340S** with an M8 connector.*
*(3) For an M12 connector, add **D** to the reference. Example: **XS4 P12PA370** becomes **XS4 P12PA370D** with an M12 connector.*

# Inductive proximity sensors

Osiprox® Technology
Plastic, cylindrical, non flush mountable
Two-wire, a.c. or d.c. supply
Three-wire, d.c. supply, solid-state output



## Characteristics

| Sensor type | | | XS4 P●●●●340● | XS4 P●●●●370● | XS4 P●●M●230● |
|---|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | | |
| **Connection** | Pre-cabled | | Length: 2 m | | |
| | Connector | | M8 on Ø 8<br>M12 on Ø 12, Ø 18 and Ø 30 | | 1/2"-20UNF |
| **Operating zone** | Ø 6.5 and Ø 8 | **mm** | **0…2** | | |
| | Ø 12 | **mm** | **0…3.2** | | |
| | Ø 18 | **mm** | **0…6.4** | | |
| | Ø 30 | **mm** | **0…12** | | |
| **Differential travel** | | **%** | 1...15 of real sensing distance (Sr) | | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 68, double insulation ⧈ for pre-cabled version (except Ø 8: IP 67)<br>IP 67 for connector version | | |
| **Storage temperature** | | **°C** | - 40…+ 85 | | |
| **Operating temperature** | | **°C** | - 25…+ 70 | | |
| **Materials** | Case | | PPS | | |
| | Cable | | PvR 3 x 0.34 mm² except Ø 6.5 and 8: 3 x 0.11 mm² | | PvR 2 x 0.34 mm² except Ø 8: 2 x 0.11 mm² |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | | |
| **Output state indication** | | | Yellow LED: annular on pre-cabled version<br>Yellow LED: 4 viewing ports at 90° on connector version | | |
| **Rated supply voltage** | | **V** | ⎓ 12…24 with protection against reverse polarity | ⎓ 12…48 with protection against reverse polarity | ∿ or ⎓ 24…240 (50/60 Hz) |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…36 | ⎓ 10…58 | ∿ or ⎓ 20…264 |
| **Switching capacity** | | **mA** | ⩽ 200 with overload and short-circuit protection | | 5…100 for Ø 8,<br>5…200 for Ø 12,<br>5…200 ⎓ and 5…300 ∿ for Ø 18 and 30 |
| **Voltage drop, closed state** | | **V** | ⩽ 2 | | ⩽ 5.5 |
| **Residual current, open state** | | **mA** | – | | ⩽ 0.6 |
| **Current consumption, no-load** | | **mA** | ⩽ 10 | | – |
| **Maximum switching frequency** | Ø 6.5, Ø 8 and Ø 12 | **Hz** | 5000 | | ⎓ 3000, ∿ 25 |
| | Ø 18 | **Hz** | 2000 | | ⎓ 2000, ∿ 25 |
| | Ø 30 | **Hz** | 1000 | | ⎓ 1000, ∿ 25 |
| **Delays** | First-up | **ms** | ⩽ 10 | | ⩽ 40 |
| | Response | **ms** | ⩽ 0.1 for Ø 8 and Ø 12, ⩽ 0.15 for Ø 18, ⩽ 0.3 for Ø 30 | | ⩽ 0.2 |
| | Recovery | **ms** | ⩽ 0.1 for Ø 8 and Ø 12, ⩽ 0.35 for Ø 18, ⩽ 0.7 for Ø 30 | | ⩽ 0.2 for Ø 8, Ø 12 and Ø 18, ⩽ 0.4 for Ø 30 |

## Wiring schemes

**Connector**

M8


M12

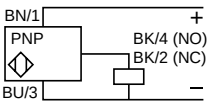

1/2"-20UNF


∿: 2
∿: 3

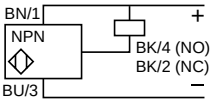
**Pre-cabled**

BU: Blue
BN: Brown
BK: Black

**PNP**

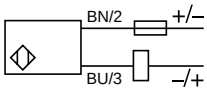



**NPN**




*For M8 connector, NO and NC outputs on terminal 4*

**2-wire ∿ or ⎓**

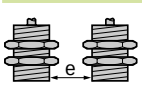


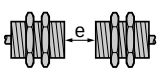

See connection on page 9/45.

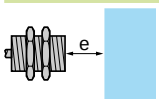
## Setting-up

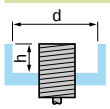
**Minimum mounting distances (mm)**

| | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| Ø 8 | e ⩾ 10 | e ⩾ 30 | e ⩾ 7.5 | d ⩾ 24 h ⩾ 5 |
| Ø 12 | e ⩾ 16 | e ⩾ 48 | e ⩾ 12 | d ⩾ 36 h ⩾ 8 |
| Ø 18 | e ⩾ 16 | e ⩾ 96 | e ⩾ 24 | d ⩾ 54 h ⩾16 |
| Ø 30 | e ⩾ 60 | e ⩾ 180 | e ⩾ 45 | d ⩾ 90 h ⩾ 30 |

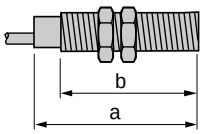



## Dimensions




| XS4 P | 3-wire ⎓ 12-24 V | | | | 3-wire ⎓ 12-48 V or 2-wire ∿/⎓ 24-240 V | | | |
|---|---|---|---|---|---|---|---|---|
| | Pre-cabled (mm) | | Connector (mm) | | Pre-cabled (mm) | | Connector (mm) | |
| | a | b | a | b | a | b | a | b |
| Ø 8 | 33 | 26 | 42 | 26 | 50 | 40 | 61 | 40 |
| Ø 12 | 33 | 26 | 48 | 27 | 50 | 42 | 61 | 42 |
| Ø 18 | 33.5 | 26 | 48 | 29 | 60 | 51.5 | 70 | 51.5 |
| Ø 30 | 40.5 | 33 | 50 | 34 | 60 | 51.5 | 70 | 51.5 |

# Inductive proximity sensors

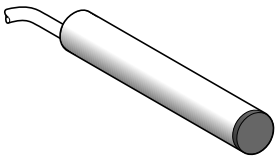
## Osiprox® Technology

### Basic, cylindrical, flush mountable, increased range

### Three-wire d.c. Solid-state output

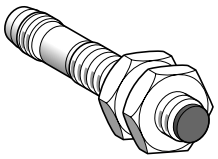


801120



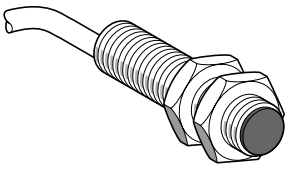
*XS1 06B3●●L2*

801167



*XS1 08B3●●M8*

801214



*XS1 12B3●●L2*

| Sensing distance Sn (mm) | Function | Output | Connection | Sold in minimum lots of | Unit reference | Weight kg |
|---|---|---|---|---|---|---|
| **Ø 6.5, plain** | | | | | | |
| **Three-wire ⎓ 12-24 V, flush mountable** | | | | | | |
| **2** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 06B3PAL2** | 0.060 |
| | | | M8 connector | 1 | **XS1 06B3PAM8** | 0.030 |
| | | | M12 connector | 1 | **XS1 06B3PAM12** | 0.050 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS1 06B3PAL2TQ** | 0.980 |
| | | | M8 connector | 20 | **XS1 06B3PAM8TQ** | 0.320 |
| | | NPN | Pre-cabled (L = 2 m) | 1 | **XS1 06B3NAL2** | 0.060 |
| | | | M8 connector | 1 | **XS1 06B3NAM8** | 0.030 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 06B3PBL2** | 0.060 |
| | | | M8 connector | 1 | **XS1 06B3PBM8** | 0.030 |
| **Ø 8, threaded M8 x 1** | | | | | | |
| **Three-wire ⎓ 12-24 V, flush mountable** | | | | | | |
| **2** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 08B3PAL2** | 0.070 |
| | | | M8 connector | 1 | **XS1 08B3PAM8** | 0.030 |
| | | | M12 connector | 1 | **XS1 08B3PAM12** | 0.060 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS1 08B3PAL2TQ** | 1.120 |
| | | | M8 connector | 20 | **XS1 08B3PAM8TQ** | 0.460 |
| | | | M12 connector | 20 | **XS1 08B3PAM12TQ** | 0.940 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 08B3NAL2** | 0.070 |
| | | | M8 connector | 1 | **XS1 08B3NAM8** | 0.030 |
| | | | M12 connector | 1 | **XS1 08B3NAM12** | 0.060 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS1 08B3NAL2TQ** | 1.120 |
| | | | M8 connector | 20 | **XS1 08B3NAM8TQ** | 0.460 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 08B3PBL2** | 0.070 |
| | | | M8 connector | 1 | **XS1 08B3PBM8** | 0.030 |
| | | | M12 connector | 1 | **XS1 08B3PBM12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 08B3NBL2** | 0.070 |
| | | | M8 connector | 1 | **XS1 08B3NBM8** | 0.030 |
| | | | M12 connector | 1 | **XS1 08B3NBM12** | 0.060 |
| **Ø 12, threaded M12 x 1** | | | | | | |
| **Three-wire ⎓ 12-24 V, flush mountable** | | | | | | |
| **4** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 12B3PAL2** | 0.090 |
| | | | M12 connector | 1 | **XS1 12B3PAM12** | 0.030 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS1 12B3PAL2TQ** | 1.600 |
| | | | M12 connector | 20 | **XS1 12B3PAM12TQ** | 0.470 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 12B3NAL2** | 0.090 |
| | | | M12 connector | 1 | **XS1 12B3NAM12** | 0.030 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS1 12B3NAL2TQ** | 1.600 |
| | | | M12 connector | 20 | **XS1 12B3NAM12TQ** | 0.470 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 12B3PBL2** | 0.090 |
| | | | M12 connector | 1 | **XS1 12B3PBM12** | 0.030 |
| | | | M12 connector | 20 | **XS1 12B3PBM12TQ** | 0.470 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 12B3NBL2** | 0.090 |
| | | | M12 connector | 1 | **XS1 12B3NBM12** | 0.030 |

*(1) For a 5 m long cable replace L2 by L5.*
*Example: XS1 06B3PAL2 becomes **XS1 06B3PAL5** with a 5 m long cable.*

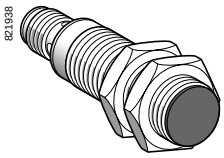
Characteristics: page 2/44 Schemes: page 2/44 Dimensions: page 2/47

# Inductive proximity sensors

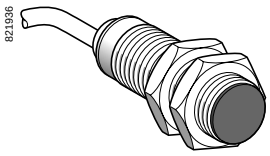
## Osiprox® Technology

### Basic, cylindrical, flush mountable, increased range

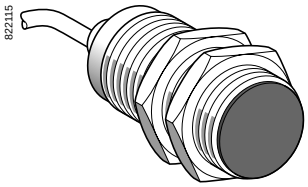
### Three-wire d.c. Solid-state output



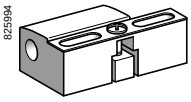

*XS1 18B3●●M12*




*XS1 18B3●●●L2*




*XS1 30B3●●L2*




*XSZ B1●●*

| Sensing distance Sn (mm) | Function | Output | Connection | Sold in minimum lots of | Unit reference | Weight kg |
|---|---|---|---|---|---|---|
| **Ø 18, threaded M18 x 1** | | | | | | |
| **Three-wire ⎓ 12-24 V, flush mountable** | | | | | | |
| **8** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 18B3PAL2** | 0.110 |
| | | | M12 connector | 1 | **XS1 18B3PAM12** | 0.060 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS1 18B3PAL2TQ** | 2.000 |
| | | | M12 connector | 20 | **XS1 18B3PAM12TQ** | 1.140 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 18B3NAL2** | 0.110 |
| | | | M12 connector | 1 | **XS1 18B3NAM12** | 0.060 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS1 18B3NAL2TQ** | 2.000 |
| | | | M12 connector | 20 | **XS1 18B3NAM12TQ** | 1.140 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 18B3PBL2** | 0.110 |
| | | | M12 connector | 1 | **XS1 18B3PBM12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 18B3NBL2** | 0.110 |
| | | | M12 connector | 1 | **XS1 18B3NBM12** | 0.060 |
| **Ø 30, threaded M30 x 1.5** | | | | | | |
| **Three-wire ⎓ 12-24 V, flush mountable** | | | | | | |
| **15** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 30B3PAL2** | 0.180 |
| | | | M12 connector | 1 | **XS1 30B3PAM12** | 0.130 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS1 30B3PAL2TQ** | 3.360 |
| | | | M12 connector | 20 | **XS1 30B3PAM12TQ** | 2.000 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 30B3NAL2** | 0.180 |
| | | | M12 connector | 1 | **XS1 30B3NAM12** | 0.130 |
| | | | M12 connector | 20 | **XS1 30B3NAM12TQ** | 2.000 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 30B3PBL2** | 0.180 |
| | | | M12 connector | 1 | **XS1 30B3PBM12** | 0.130 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS1 30B3NBL2** | 0.180 |
| | | | M12 connector | 1 | **XS1 30B3NBM12** | 0.130 |

**Accessories** *(2)*

| Description | For use with sensors | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø = 6.5 (plain) | **XSZ B165** | 0.005 |
| | Ø 8 (M8 x 1) | **XSZ B108** | 0.006 |
| | Ø 12 (M12 x 1) | **XSZ B112** | 0.006 |
| | Ø 18 (M18 x 1) | **XSZ B118** | 0.010 |
| | Ø 30 (M30 x 1.5) | **XSZ B130** | 0.020 |

*(1) For a 5 m long cable replace L2 by L5.*
*Example: XS1 18B3PAL2 becomes **XS1 18B3PAL5** with a 5 m long cable.*
*(2) For further information, see page 2/106.*

Characteristics: page 2/44
Schemes: page 2/44
Dimensions: page 2/47

# Inductive proximity sensors

Osiprox® Technology

Basic, cylindrical, flush mountable, increased range

Three-wire d.c. Solid-state output



## Characteristics

| Sensor type | | | XS1 ●●B3●●M8 | XS1 ●●B3●●M12 | XS1 ●●B3●●L2 |
|---|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | | |
| **Connection** | Connector | | M8 | M12 | – |
| | Pre-cabled | | – | – | Length 2 m |
| **Operating zone** *(1)* | Ø 6.5 and Ø 8 | **mm** | **0…1.6** | | |
| | Ø 12 | **mm** | **0…3.2** | | |
| | Ø 18 | **mm** | **0…6.4** | | |
| | Ø 30 | **mm** | **0…12** | | |
| **Differential travel** | | **%** | 1...15 of effective sensing distance (Sr) | | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 65 and IP 67 | | |
| **Storage temperature** | | **°C** | - 40…+ 85 | | |
| **Operating temperature** | | **°C** | - 25…+ 70 | | |
| **Materials** | Case | | Nickel plated brass | | |
| | Cable | | – | | PvR 3 x 0.34 mm² except Ø 6.5 and 8: 3 x 0.11 mm² |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | | |
| **Output state indication** | | | Yellow LED, 4 viewing ports at 90° | | Yellow LED, annular |
| **Rated supply voltage** | | **V** | ⎓ 12…24 with protection against reverse polarity | | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…36 | | |
| **Switching capacity** | | **mA** | ≤ 200 with overload and short-circuit protection | | |
| **Voltage drop, closed state** | | **V** | ≤ 2 | | |
| **Current consumption, no-load** | | **mA** | ≤ 10 | | |
| **Maximum switching frequency** | Ø 6.5, Ø 8 and Ø 12 | **Hz** | 2500 | | |
| | Ø 18 | **Hz** | 1000 | | |
| | Ø 30 | **Hz** | 500 | | |
| **Delays** | First-up | **ms** | ≤ 10 | | |
| | Response | **ms** | ≤ 0.2 for Ø 8 and Ø 12, ≤ 0.3 for Ø 18, ≤ 0.6 for Ø 30 | | |
| | Recovery | **ms** | ≤ 0.2 for Ø 8 and Ø 12, ≤ 0.7 for Ø 18, ≤ 1.4 for Ø 30 | | |

*(1) Detection curves, see page 2/110.*

## Wiring schemes

### Connector

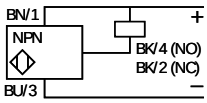
M8


M12

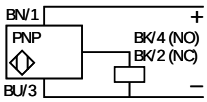

### Pre-cabled

BU: Blue
BN: Brown
BK: Black

### NPN




### PNP




*For M8 connector, NO and NC outputs on terminal 4*

See connection on page 9/45.

References:
pages 2/44 and 2/45

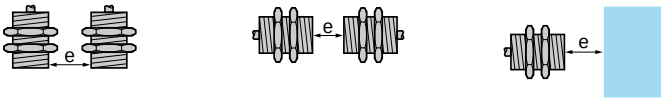
Dimensions:
page 2/47

# Inductive proximity sensors
Osiprox® Technology
Basic, cylindrical, flush mountable, increased range
Three-wire d.c. Solid-state output



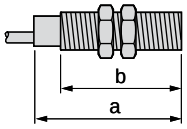
## Setting-up

### Minimum mounting distances (mm)




| Sensors | | Side by side | Face to face | Facing a metal object |
|---|---|---|---|---|
| **Ø 6.5 flush mountable** | **XS1 06 B3** | e ≥ 4 | e ≥ 24 | e ≥ 6 |
| **Ø 8 flush mountable** | **XS1 08 B3** | e ≥ 4 | e ≥ 24 | e ≥ 6 |
| **Ø 12 flush mountable** | **XS1 12 B3** | e ≥ 8 | e ≥ 50 | e ≥ 12 |
| **Ø 18 flush mountable** | **XS1 18 B3** | e ≥ 16 | e ≥ 100 | e ≥ 25 |
| **Ø 30 flush mountable** | **XS1 30 B3** | e ≥ 30 | e ≥ 180 | e ≥ 45 |

## Dimensions




| | | Flush mountable in metal | | | | | |
|---|---|---|---|---|---|---|---|
| **Sensors** | | **Pre-cabled (mm)** | | **M8 connector (mm)** | | **M12 connector (mm)** | |
| | | **a** | **b** | **a** | **b** | **a** | **b** |
| **Ø 6.5** | **XS1 06 B3** | 33 | 30 | 42 | 34 | 45 | 24 |
| **Ø 8** | **XS1 08 B3** | 33 | 25 | 42 | 26 | 45 | 23 |
| **Ø 12** | **XS1 12 B3** | 35 | 25 | – | – | 50 | 29 |
| **Ø 18** | **XS1 18 B3** | 38 | 28 | – | – | 50.3 | 28 |
| **Ø 30** | **XS1 30 B3** | 42.3 | 32 | – | – | 54.5 | 32 |

# Inductive proximity sensors

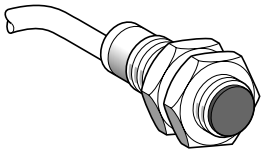
## Osiprox® Technology

### Basic, plastic, cylindrical, non flush mountable

### Three-wire, d.c. supply, solid-state output

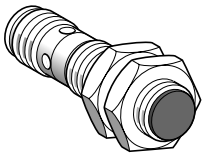


801231



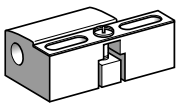
*XS2 ●●AL●●L2*

801232



*XS2 ●●AL●●M12*

825994



*XSZ B1●●*

| Sensing distance Sn (mm) | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Ø 8, threaded M8 x 1** | | | | | |
| **Three-wire ⎓ 12-24 V, non flush mountable** | | | | | |
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 08ALPAL2** | 0.030 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 08ALNAL2** | 0.030 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 08ALPBL2** | 0.003 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 08ALNBL2** | 0.030 |
| **Ø 12, threaded M12 x 1** | | | | | |
| **Three-wire ⎓ 12-24 V, non flush mountable** | | | | | |
| **4** | NO | PNP | Pre-cabled (L = 2 m) *(2)* | **XS2 12ALPAL2** | 0.065 |
| | | | M12 connector | **XS2 12ALPAM12** | 0.010 |
| | | NPN | Pre-cabled (L = 2 m) *(2)* | **XS2 12ALNAL2** | 0.065 |
| | | | M12 connector | **XS2 12ALNAM12** | 0.010 |
| | NC | PNP | Pre-cabled (L = 2 m) *(2)* | **XS2 12ALPBL2** | 0.065 |
| | | | M12 connector | **XS2 12ALPBM12** | 0.010 |
| | | NPN | Pre-cabled (L = 2 m) *(2)* | **XS2 12ALNBL2** | 0.065 |
| | | | M12 connector | **XS2 12ALNBM12** | 0.010 |
| **Ø 18, threaded M18 x 1** | | | | | |
| **Three-wire ⎓ 12-24 V, non flush mountable** | | | | | |
| **8** | NO | PNP | Pre-cabled (L = 2 m) *(2)* | **XS2 18ALPAL2** | 0.095 |
| | | | M12 connector | **XS2 18ALPAM12** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) *(2)* | **XS2 18ALNAL2** | 0.095 |
| | | | M12 connector | **XS2 18ALNAM12** | 0.025 |
| | NC | PNP | Pre-cabled (L = 2 m) *(2)* | **XS2 18ALPBL2** | 0.095 |
| | | | M12 connector | **XS2 18ALPBM12** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) *(2)* | **XS2 18ALNBL2** | 0.095 |
| | | | M12 connector | **XS2 18ALNBM12** | 0.025 |
| **Ø 30, threaded M30 x 1.5** | | | | | |
| **Three-wire ⎓ 12-24 V, non flush mountable** | | | | | |
| **15** | NO | PNP | Pre-cabled (L = 2 m) *(2)* | **XS2 30ALPAL2** | 0.135 |
| | | | M12 connector | **XS2 30ALPAM12** | 0.065 |
| | | NPN | Pre-cabled (L = 2 m) *(2)* | **XS2 30ALNAL2** | 0.135 |
| | | | M12 connector | **XS2 30ALNAM12** | 0.065 |
| | NC | PNP | Pre-cabled (L = 2 m) *(2)* | **XS2 30ALPBL2** | 0.135 |
| | | | M12 connector | **XS2 30ALPBM12** | 0.065 |
| | | NPN | Pre-cabled (L = 2 m) *(2)* | **XS2 30ALNBL2** | 0.135 |
| | | | M12 connector | **XS2 30ALNBM12** | 0.065 |

**Accessories** *(3)*

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 8 | **XSZ B108** | 0.006 |
| | Ø 12 | **XSZ B112** | 0.006 |
| | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

*(1) For a 5 m long cable replace L2 by L5.*
*Example: XS2 08ALPAL2 becomes **XS2 08ALPAL5** with a 5 m long cable.*
*(2) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10.*
*Example: XS2 18ALPAL2 becomes **XS2 18ALPAL5** with a 5 m long cable.*
*(3) For further information, see page 2/106.*

Characteristics: page 2/49 Schemes: page 2/49 Dimensions: page 2/49

# Inductive proximity sensors
## Osiprox® Technology
Basic, plastic, cylindrical, non flush mountable
Three-wire, d.c. supply, solid-state output



## Characteristics

| Sensor type | | | XS2 ●●ALP●L2<br>XS2 ●●ALN●L2 | XS2 ●●ALP●M12<br>XS2 ●●ALN●M12 |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | |
| **Connection** | Pre-cabled | | Length: 2 m | – |
| | Connector | | – | M12 |
| **Operating zone** *(1)* | Ø 8 | **mm** | **0…2** | |
| | Ø 12 | **mm** | **0…3.2** | |
| | Ø 18 | **mm** | **0…6.4** | |
| | Ø 30 | **mm** | **0…12** | |
| **Differential travel** | | **%** | 1...15 of real sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | |
| **Storage temperature** | | **°C** | - 40…+ 85 | |
| **Operating temperature** | | **°C** | - 25…+ 70 | |
| **Materials** | Case | | PPS | |
| | Cable | | PVC 3 x 0.34 mm² except Ø 8: 3 x 0.11 mm² | – |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Output state indication** | | | Yellow LED, on rear | Yellow LED: 4 viewing ports at 90° |
| **Rated supply voltage** | | **V** | ⎓ 12…24 with protection against reverse polarity | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…36 | |
| **Switching capacity** | | **mA** | ≤ 100 (except Ø 8: ≤ 50) with overload and short-circuit protection | |
| **Voltage drop, closed state** | | **V** | ≤ 2 | |
| **Current consumption, no-load** | | **mA** | ≤ 10 | |
| **Maximum switching frequency** | Ø 8 | **Hz** | 3000 | |
| | Ø 12 | **Hz** | 1000 | |
| | Ø 18 | **Hz** | 250 | |
| | Ø 30 | **Hz** | 60 | |
| **Delays** | First-up | **ms** | ≤ 5 (except Ø 30 ≤ 10) | |
| | Response | **ms** | ≤ 0.5 for Ø 8, Ø 12, ≤ 1 for Ø 18, ≤ 2 for Ø 30 | |
| | Recovery | **ms** | ≤ 1 for Ø 8, ≤ 0.5 for Ø 12, ≤ 2 for Ø 18, ≤ 6 for Ø 30 | |

*(1) Detection curves, see page 2/110.*

## Wiring schemes

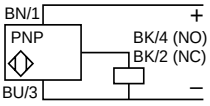
**Connector**

M12

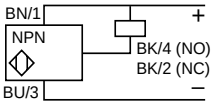

**Pre-cabled**

BU: Blue
BN: Brown
BK: Black

**PNP**




**NPN**



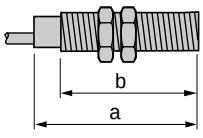

See connection on page 9/45.

## Setting-up

**Minimum mounting distances (mm)**


| Sensors | | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|---|
| **Ø 8** | **XS2 08AL** | e > 10 | e > 30 | e > 7.5 | d > 24 h > 5 |
| **Ø 12** | **XS2 12AL** | e > 16 | e > 48 | e > 12 | d > 36 h > 8 |
| **Ø 18** | **XS2 18AL** | e > 16 | e > 96 | e > 24 | d > 54 h > 16 |
| **Ø 30** | **XS2 30AL** | e > 60 | e > 180 | e > 45 | d > 90 h > 30 |

## Dimensions




**Non flush mountable in metal**

| Sensors | | Pre-cabled (mm) | | Connector (mm) | |
|---|---|---|---|---|---|
| | | **a** | **b** | **a** | **b** |
| Ø 8 | XS2 08AL | 49 | 40 | – | – |
| Ø 12 | XS2 12AL | 49 | 42 | 61 | 42 |
| Ø 18 | XS2 18AL | 58.8 | 51.5 | 70.3 | 51.5 |
| Ø 30 | XS2 30AL | 58.8 | 51.5 | 70.3 | 51.5 |

References:
page 2/48

# Inductive proximity sensors

## Osiprox® Technology

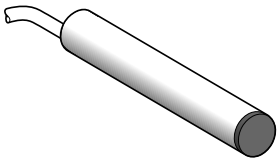
Basic, cylindrical, metal, flush and non flush mountable

Two-wire, a.c. supply

Three-wire, d.c. supply, solid-state output

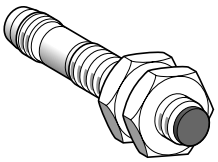


801120



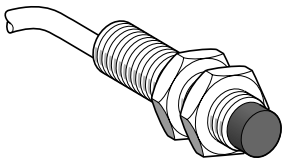
*XS1 06BL●●L2*

801167



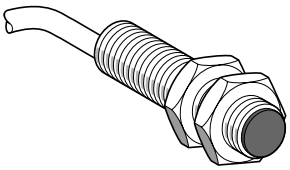
*XS1 08BL●●M8*

801220



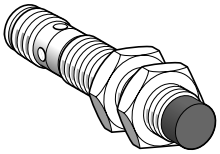
*XS2 08BL●●L2*

801214



*XS1 12BL●●L2*

801225



*XS2 12BL●●M12*

| Sensing distance Sn (mm) | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Ø 6.5, plain** | | | | | |
| **Three-wire ⎓ 12-24 V, flush mountable** | | | | | |
| **1.5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS1 06BLPAL2** | 0.030 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 06BLNAL2** | 0.030 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS1 06BLPBL2** | 0.030 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 06BLNBL2** | 0.030 |
| **Ø 8, threaded M8 x 1** | | | | | |
| **Three-wire ⎓ 12-24 V, flush mountable** | | | | | |
| **1.5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS1 08BLPAL2** | 0.035 |
| | | | M8 connector | **XS1 08BLPAM8** | 0.008 |
| | | | M12 connector | **XS1 08BLPAM12** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 08BLNAL2** | 0.035 |
| | | | M8 connector | **XS1 08BLNAM8** | 0.008 |
| | | | M12 connector | **XS1 08BLNAM12** | 0.015 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS1 08BLPBL2** | 0.035 |
| | | | M8 connector | **XS1 08BLPBM8** | 0.008 |
| | | | M12 connector | **XS1 08BLPBM12** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 08BLNBL2** | 0.035 |
| | | | M8 connector | **XS1 08BLNBM8** | 0.008 |
| | | | M12 connector | **XS1 08BLNBM12** | 0.015 |
| **Three-wire ⎓ 12-24 V, non flush mountable** | | | | | |
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 08BLPAL2** | 0.035 |
| | | | M8 connector | **XS2 08BLPAM8** | 0.008 |
| | | | M12 connector | **XS2 08BLPAM12** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 08BLNAL2** | 0.035 |
| | | | M8 connector | **XS2 08BLNAM8** | 0.008 |
| | | | M12 connector | **XS2 08BLNAM12** | 0.015 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 08BLPBL2** | 0.035 |
| | | | M8 connector | **XS2 08BLPBM8** | 0.008 |
| | | | M12 connector | **XS2 08BLPBM12** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 08BLNBL2** | 0.035 |
| | | | M8 connector | **XS2 08BLNBM8** | 0.008 |
| | | | M12 connector | **XS2 08BLNBM12** | 0.015 |
| **Ø 12, threaded M12 x 1** | | | | | |
| **Three-wire ⎓ 12-24 V, flush mountable** | | | | | |
| **2** | NO | PNP | Pre-cabled (L = 2 m) *(2)* | **XS1 12BLPAL2** | 0.070 |
| | | | M12 connector | **XS1 12BLPAM12** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) *(2)* | **XS1 12BLNAL2** | 0.070 |
| | | | M12 connector | **XS1 12BLNAM12** | 0.015 |
| | NC | PNP | Pre-cabled (L = 2 m) *(2)* | **XS1 12BLPBL2** | 0.070 |
| | | | M12 connector | **XS1 12BLPBM12** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) *(2)* | **XS1 12BLNBL2** | 0.070 |
| | | | M12 connector | **XS1 12BLNBM12** | 0.015 |
| **Two-wire ∿ 24-240 V, flush mountable** | | | | | |
| **2** | NO | | Pre-cabled (L = 2 m) *(2)* | **XS1 12BLFAL2** | 0.075 |
| **Three-wire ⎓ 12-24 V, non flush mountable** | | | | | |
| **4** | NO | PNP | Pre-cabled (L = 2 m) *(2)* | **XS2 12BLPAL2** | 0.070 |
| | | | M12 connector | **XS2 12BLPAM12** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) *(2)* | **XS2 12BLNAL2** | 0.070 |
| | | | M12 connector | **XS2 12BLNAM12** | 0.015 |
| | NC | PNP | Pre-cabled (L = 2 m) *(2)* | **XS2 12BLPBL2** | 0.070 |
| | | | M12 connector | **XS2 12BLPBM12** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) *(2)* | **XS2 12BLNBL2** | 0.070 |
| | | | M12 connector | **XS2 12BLNBM12** | 0.015 |

*(1) For a 5 m long cable replace L2 by L5.*
*Example: XS1 06BLPAL2 becomes **XS1 06BLPAL5** with a 5 m long cable.*
*(2) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10.*
*Example: XS1 12BLPAL2 becomes **XS1 12BLPAL5** with a 5 m long cable.*

Characteristics: page 2/52 Schemes: page 2/52 Dimensions: page 2/53

# Inductive proximity sensors

## Osiprox® Technology

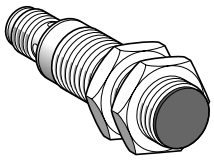
Basic, cylindrical, metal, flush and non flush mountable

Two-wire, a.c. supply

Three-wire, d.c. supply, solid-state output

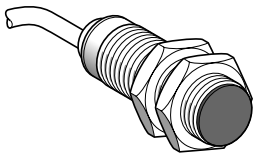


821938



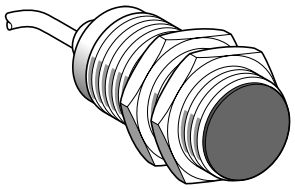
*XS1 18BL●●M12*

821936



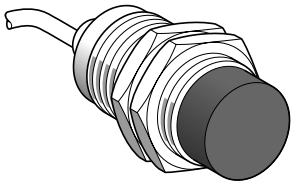
*XS1 18BL●●●L2*

822115



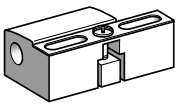
*XS1 30BL●●L2*

822116



*XS2 30BL●●L2*

825694



*XSZ B1●●*

| Sensing distance Sn (mm) | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Ø 18, threaded M18 x 1** | | | | | |
| **Three-wire ⎓ 12-24 V, flush mountable** | | | | | |
| **5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS1 18BLPAL2** | 0.105 |
| | | | M12 connector | **XS1 18BLPAM12** | 0.035 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 18BLNAL2** | 0.105 |
| | | | M12 connector | **XS1 18BLNAM12** | 0.035 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS1 18BLPBL2** | 0.105 |
| | | | M12 connector | **XS1 18BLPBM12** | 0.035 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 18BLNBL2** | 0.105 |
| | | | M12 connector | **XS1 18BLNBM12** | 0.035 |
| **Two-wire ∿ 24-240 V, flush mountable** | | | | | |
| **5** | NO | | Pre-cabled (L = 2 m) *(1)* | **XS1 18BLFAL2** | 0.120 |
| **Three-wire ⎓ 12-24 V, non flush mountable** | | | | | |
| **8** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 18BLPAL2** | 0.105 |
| | | | M12 connector | **XS2 18BLPAM12** | 0.035 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 18BLNAL2** | 0.105 |
| | | | M12 connector | **XS2 18BLNAM12** | 0.035 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 18BLPBL2** | 0.105 |
| | | | M12 connector | **XS2 18BLPBM12** | 0.035 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 18BLNBL2** | 0.105 |
| | | | M12 connector | **XS2 18BLNBM12** | 0.035 |
| **Ø 30, threaded M30 x 1.5** | | | | | |
| **Three-wire ⎓ 12-24 V, flush mountable** | | | | | |
| **10** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS1 30BLPAL2** | 0.165 |
| | | | M12 connector | **XS1 30BLPAM12** | 0.075 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 30BLNAL2** | 0.165 |
| | | | M12 connector | **XS1 30BLNAM12** | 0.075 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS1 30BLPBL2** | 0.165 |
| | | | M12 connector | **XS1 30BLPBM12** | 0.075 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 30BLNBL2** | 0.165 |
| | | | M12 connector | **XS1 30BLNBM12** | 0.075 |
| **Two-wire ∿ 24-240 V, flush mountable** | | | | | |
| **10** | NO | | Pre-cabled (L = 2 m) *(1)* | **XS1 30BLFAL2** | 0.205 |
| **Three-wire ⎓ 12-24 V, non flush mountable** | | | | | |
| **15** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 30BLPAL2** | 0.155 |
| | | | M12 connector | **XS2 30BLPAM12** | 0.085 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 30BLNAL2** | 0.155 |
| | | | M12 connector | **XS2 30BLNAM12** | 0.085 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 30BLPBL2** | 0.155 |
| | | | M12 connector | **XS2 30BLPBM12** | 0.085 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 30BLNBL2** | 0.155 |
| | | | M12 connector | **XS2 30BLNBM12** | 0.085 |

**Accessories** *(2)*

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 6.5 | **XSZ B165** | 0.005 |
| | Ø 8 | **XSZ B108** | 0.006 |
| | Ø 12 | **XSZ B112** | 0.006 |
| | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

*(1) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10.*
*Example: XS1 18BLPAL2 becomes **XS1 18BLPAL5** with a 5 m long cable.*
*(2) For further information, see page 2/106.*

Characteristics: page 2/52 Schemes: page 2/52 Dimensions: page 2/53

# Inductive proximity sensors

Osiprox® Technology

Basic, cylindrical, metal, flush and non flush mountable

Two-wire, a.c. supply

Three-wire, d.c. supply, solid-state output



## Characteristics

| Sensor type | | | XS1 ●●BLP●L2<br>XS1 ●●BLN●L2 | XS1 ●●BLP●M●<br>XS1 ●●BLN●M● | XS2 ●●BLP●L2<br>XS2 ●●BLN●L2 | XS2 ●●BLP●M●<br>XS2 ●●BLN●M● | XS1 ●●BLFAL2 |
|---|---|---|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | | | | |
| **Connection** | Pre-cabled | | Length 2 m | – | Length 2 m | – | Length 2 m |
| | Connector | | – | M8 on Ø 8<br>M12 on Ø 8, Ø 12, Ø 18 and Ø 30 | – | M8 on Ø 8<br>M12 on Ø 8, Ø 12, Ø 18 and Ø 30 | – |
| **Operating zone** *(1)* | Ø 6.5 | **mm** | **0…1.2** | | – | | – |
| | Ø 8 | **mm** | **0…1.2** | | **0…2** | | – |
| | Ø 12 | **mm** | **0…1.6** | | **0…3.2** | | **0…1.6** |
| | Ø 18 | **mm** | **0…4** | | **0…6.4** | | **0…4** |
| | Ø 30 | **mm** | **0…8** | | **0…12** | | **0…8** |
| **Differential travel** | | **%** | 1...15 of real sensing distance (Sr) | | | | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | | | | |
| **Storage temperature** | | **°C** | - 40…+ 85 | | | | |
| **Operating temperature** | | **°C** | - 25…+ 70 | | | | |
| **Materials** | Case | | Nickel plated brass | | | | |
| | Cable | | PVC<br>3 x 0.34 mm²<br>except Ø 6.5 and 8:<br>3 x 0.11 mm² | – | PVC<br>3 x 0.34 mm²<br>except Ø 6.5 and 8:<br>3 x 0.11 mm² | – | PVC<br>2 x 0.34 mm² |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | | | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | | | | |
| **Output state indication** | | | Yellow LED, on rear | Yellow LED: 4 viewing ports at 90° | Yellow LED, on rear | Yellow LED: 4 viewing ports at 90° | Yellow LED, on rear |
| **Rated supply voltage** | | **V** | ⎓ 12…24 with protection against reverse polarity | | | | ∿ 24…240 |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…36 | | | | ∿ 20…264 |
| **Switching capacity** | | **mA** | ⩽ 100 (except Ø 6.5 and 8: ⩽ 50) with overload and short-circuit protection | | | | 5…300 (5…200 for Ø 12) *(2)* |
| **Voltage drop, closed state** | | **V** | ⩽ 2 | | | | ⩽ 4.5 (⩽ 7 for Ø 12) |
| **Current consumption, no-load** | | **mA** | ⩽ 10 | | | | – |
| **Residual current, open state** | | **mA** | – | | | | ≤ 1.5 |
| **Maximum switching frequency** | Ø 6.5, Ø 8 | **Hz** | 3000 | | | | – |
| | Ø 12 | **Hz** | 2000 | | 1000 | | 25 |
| | Ø 18 | **Hz** | 2000 | | 250 | | 25 |
| | Ø 30 | **Hz** | 200 | | 60 | | 25 |
| **Delays** | First-up | **ms** | ⩽ 5 (except Ø 30 ⩽ 10) | | | | ⩽ 40 |
| | Response | **ms** | ⩽ 0.5 for Ø 8, Ø 12, ⩽ 1 for Ø 18, ⩽ 2 for Ø 30 | | | | ⩽ 10 |
| | Recovery | **ms** | ⩽ 1 for Ø 8, ⩽ 0.5 for Ø 12, ⩽ 2 for Ø 18, ⩽ 6 for Ø 30 | | | | ⩽ 15 |

*(1) Detection curves, see page 2/110.*

*(2) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A "quick-blow" fuse in series with the load, see page 2/106.*

## Wiring schemes

### Connector

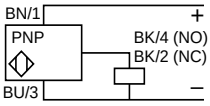
M8


M12

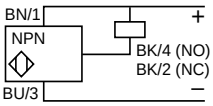

### Pre-cabled

BU: Blue
BN: Brown
BK: Black

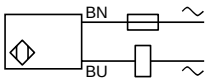
### PNP




### NPN




### 2-wire ∿




See connection on page 9/45.

References:
pages 2/50 and 2/51

Dimensions:
page 2/53

# Inductive proximity sensors

Osiprox® Technology

Basic, cylindrical, metal, flush and non flush mountable

Two-wire, a.c. supply

Three-wire, d.c. supply, solid-state output

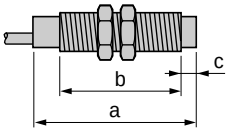


## Setting-up

### Minimum mounting distances (mm)


| Sensors | | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|---|
| **Ø 6.5 flush mountable** | **XS1 06** | e ≥ 3 | e ≥ 18 | e ≥ 4.5 | d ≥ 6,5 h ≥ 0 |
| **Ø 8 flush mountable** | **XS1 08** | e ≥ 3 | e ≥ 18 | e ≥ 4.5 | d ≥ 8 h ≥ 0 |
| **Ø 8 non flush mountable** | **XS2 08** | e ≥ 10 | e ≥ 30 | e ≥ 7.5 | d ≥ 24 h ≥ 5 |
| **Ø 12 flush mountable** | **XS1 12** | e ≥ 4 | e ≥ 24 | e ≥ 6 | d ≥ 12 h ≥ 0 |
| **Ø 12 non flush mountable** | **XS2 12** | e ≥ 16 | e ≥ 48 | e ≥ 12 | d ≥ 36 h ≥ 8 |
| **Ø 18 flush mountable** | **XS1 18** | e ≥ 10 | e ≥ 60 | e ≥ 15 | d ≥ 18 h ≥ 0 |
| **Ø 18 non flush mountable** | **XS2 18** | e ≥ 16 | e ≥ 96 | e ≥ 24 | d ≥ 54 h ≥ 16 |
| **Ø 30 flush mountable** | **XS1 30** | e ≥ 20 | e ≥ 120 | e ≥ 30 | d ≥ 30 h ≥ 0 |
| **Ø 30 non flush mountable** | **XS2 30** | e ≥ 60 | e ≥ 180 | e ≥ 45 | d ≥ 90 h ≥ 30 |

## Dimensions




### Flush mountable in metal

| Sensors | | Pre-cabled (mm) | | M8 connector (mm) | | M12 connector (mm) | |
|---|---|---|---|---|---|---|---|
| | | a | b | a | b | a | b |
| **Ø 6.5** | **XS1 06** | 42 | – | – | – | – | – |
| **Ø 8** | **XS1 08** | 42 | 39.4 | 52.2 | 41.3 | 61.4 | 39 |
| **Ø 12** | **XS1 12** | 41.3 | 38.7 | – | – | 53 | 39 |
| **Ø 18** | **XS1 18** | 51.3 | 48.4 | – | – | 64 | 48.5 |
| **Ø 30** | **XS1 30** | 51.3 | 48.4 | – | – | 64 | 48.5 |

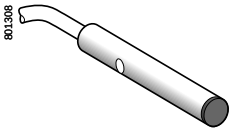
### Non flush mountable in metal

| Sensors | | Pre-cabled (mm) | | M8 connector (mm) | | | M12 connector (mm) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | a | b | a | b | c | a | b | c |
| **Ø 8** | **XS2 08** | 42 | 35.8 | 52.2 | 37.7 | 4 | 61.4 | 35.4 | 4 |
| **Ø 12** | **XS2 12** | 41.3 | 34.1 | – | – | – | 52.6 | 34 | 5 |
| **Ø 18** | **XS2 18** | 50.6 | 40.4 | – | – | – | 63.4 | 40.5 | 8 |
| **Ø 30** | **XS2 30** | 50.6 | 35.4 | – | – | – | 63.4 | 35.5 | 13 |

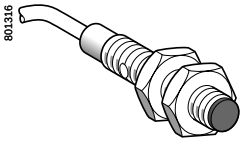
References: pages 2/50 and 2/51
Characteristics: page 2/52
Schemes: page 2/52

# Inductive proximity sensors
## Osiprox® Technology
### Miniature, cylindrical, flush and non flush mountable
### Three-wire, d.c. supply, solid-state output

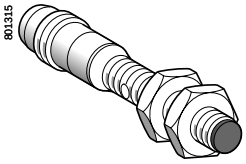




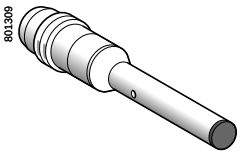

*XS1 L04●●310*



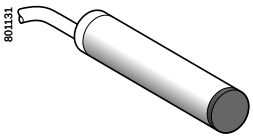

*XS1 N05●●310*



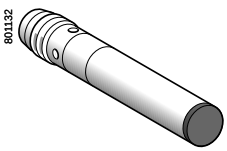

*XS1 N05●●311S*



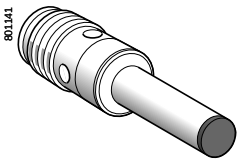

*XS1 L04●●310S*




*XS● L06●●340*




*XS● L06●●340S*
*XS● L06●●349S*




*XS● L06●●340D*

### Ø 4 plain *(1)*

| Sensing distance (Sn) mm | Function | Output | Connection *(2)* | Reference | Weight kg |
|---|---|---|---|---|---|
| **Brass case, flush mountable** | | | | | |
| **1** | NO | PNP | Pre-cabled (L = 2 m) | **XS1 L04PA310** | 0.025 |
| | | | M8 connector | **XS1 L04PA310S** | 0.010 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 L04NA310** | 0.025 |
| | | | M8 connector | **XS1 L04NA310S** | 0.010 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1 L04PB310** | 0.025 |
| | | | M8 connector | **XS1 L04PB310S** | 0.010 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 L04NB310** | 0.025 |
| | | | M8 connector | **XS1 L04NB310S** | 0.010 |
| **Stainless steel case, flush mountable** | | | | | |
| **0.8** | NO | PNP | Pre-cabled (L = 2 m) | **XS1 L04PA311** | 0.025 |
| | | | M8 connector | **XS1 L04PA311S** | 0.010 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 L04NA311** | 0.025 |
| | | | M8 connector | **XS1 L04NA311S** | 0.010 |

### Ø 5, threaded M5 x 0.5 *(1)*

| Sensing distance (Sn) mm | Function | Output | Connection *(2)* | Reference | Weight kg |
|---|---|---|---|---|---|
| **Brass case, flush mountable** | | | | | |
| **1** | NO | PNP | Pre-cabled (L = 2 m) | **XS1 N05PA310** | 0.030 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 N05NA310** | 0.030 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1 N05PB310** | 0.030 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 N05NB310** | 0.030 |
| **Stainless steel case, flush mountable** | | | | | |
| **0.8** | NO | PNP | Pre-cabled (L = 2 m) | **XS1 N05PA311** | 0.030 |
| | | | M8 connector | **XS1 N05PA311S** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 N05NA311** | 0.030 |
| | | | M8 connector | **XS1 N05NA311S** | 0.015 |

### Ø 6.5 plain *(1)*

| Sensing distance (Sn) mm | Function | Output | Connection *(2)* | Reference | Weight kg |
|---|---|---|---|---|---|
| **Stainless steel case, flush mountable** | | | | | |
| **1.5** | NO | PNP | Pre-cabled (L = 2 m) | **XS1 L06PA340** | 0.025 |
| | | | M8 connector | **XS1 L06PA340S** | 0.010 |
| | | | M12 connector | **XS1 L06PA340D** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 L06NA340** | 0.010 |
| | | | M8 connector | **XS1 L06NA340S** | 0.025 |
| | | | M12 connector | **XS1 L06NA340D** | 0.015 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1 L06PB340** | 0.025 |
| | | | M8 connector | **XS1 L06PB340S** | 0.010 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 L06NB340** | 0.025 |
| | | | M8 connector | **XS1 L06NB340S** | 0.010 |
| **Stainless steel case, non flush mountable** | | | | | |
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) | **XS2 L06PA340** | 0.025 |
| | | | M8 connector | **XS2 L06PA340S** | 0.010 |
| | | | M12 connector | **XS2 L06PA340D** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) | **XS2 L06NA340** | 0.025 |
| | | | M8 connector | **XS2 L06NA340S** | 0.010 |
| | | | M12 connector | **XS2 L06NA340D** | 0.015 |

*(1) For accessories, see page 2/106.*
*(2) For a 5 m long cable add **L1** to the reference, for 10 m long cable add **L2 to the reference**.*
*Example: **XS1 L04PA310** becomes **XS1 L04PA310L1** with a 5 m long cable.*

# Inductive proximity sensors
## Osiprox® Technology
Miniature, cylindrical, flush and non flush mountable
Three-wire, d.c. supply, solid-state output



## Characteristics

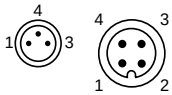
| Sensor type | | | XS1 ●●●●●●●●S; XS1 ●●●●●●●●D; XS2 L06●A340● | XS1 ●●●●●●●; XS2 L06●A340 |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | |
| **Connection** | Connector | | M8 on **XS1 ●●●●●●●●S** and M12 on **XS1 ●●●●●●●●D** | – |
| | Pre-cabled | | – | Length: 2 m |
| **Operating zone** *(1)* | Ø 4 | **mm** | **0…0.8 (brass), 0…0.6 (stainless steel)** | |
| | Ø 5 | **mm** | **0…0.8 (brass), 0…0.6 (stainless steel)** | |
| | Ø 6.5 flush mountable | **mm** | **0…1.2 (stainless steel)** | |
| | Ø 6.5 non flush mountable | **mm** | **0…2 (stainless steel)** | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | |
| **Storage temperature** | | **°C** | - 40…+ 85 | |
| **Operating temperature** | | **°C** | - 25…+ 70 | |
| **Materials** | Case | | Nickel plated brass or stainless steel grade 303 | |
| | Pre-cabled | | PvR, 3 x 0.11 mm² or 4 x 0.08 mm² | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Output state indication** | | | Yellow LED, 4 viewing ports at 90° | Yellow LED, annular |
| **Rated supply voltage** | | **V** | ⎓ 5…24 for **XS1 L04●●●●●●** and **XS1 N05●●●●●●**<br>⎓ 12…24 for **XS● L06●●●●●●** | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 5…30 for **XS1 L04●●●●●●** and **XS1 N05●●●●●●**<br>⎓ 10…38 for **XS● L06●●●●●●** | |
| **Current consumption, no-load** | | **mA** | ≤ 10 | |
| **Switching capacity** | 3-wire PNP/NPN | **mA** | ≤ 100 with overload and short-circuit protection<br>≤ 200 for **XS● L06** with overload and short-circuit protection | |
| **Voltage drop, closed state** | | **V** | ≤ 2 | |
| **Maximum switching frequency** | | **kHz** | 5 | |
| **Delays** | First-up | **ms** | ≤ 5 | |
| | Response | **ms** | ≤ 0.1 | |
| | Recovery | **ms** | ≤ 0.1 | |

*(1) Detection curves, see page 2/110*

## Wiring schemes

### Connector

M8 M12

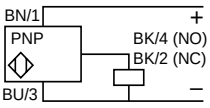



*See connection on page 9/45.*

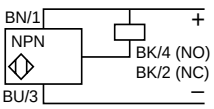
### Pre-cabled

BU : Blue
BN : Brown
BK : Black
WH : White

### PNP 3-wire



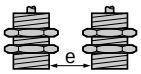
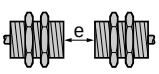
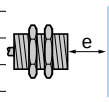
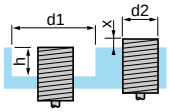

### NPN 3-wire




*For M8 connector, NO and NC outputs on terminal 4.*

## Setting-up

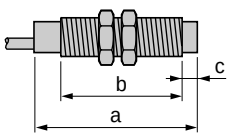
### Minimum mounting distances (mm)

| Sensor | Side by side | | Face to face | | Facing a metal object | | |
|---|---|---|---|---|---|---|---|
| Ø 4 |  | e ≥ 2 |  | e ≥ 12 |  | e ≥ 3 |  d1 ≥ 4, h ≥ 0 – |
| Ø 5 | | e ≥ 2 | | e ≥ 12 | | e ≥ 3 | d1 ≥ 5, h ≥ 0 – |
| Ø 6.5 | | e ≥ 3 | | e ≥ 18 | | e ≥ 4.5 | d1 ≥ 3, h ≥ 0 – |
| Ø 6.5, XS2 L06●A340● | | e ≥ 5 | | e ≥ 30 | | e ≥ 7.5 | d1 ≥ 10, h ≥ 1.6 d2 ≥ 6.5, x ≥ 1.3 |

### Tightening torque

Stainless steel: 2.2 N.m
Brass: 1.6 N.m

## Dimensions



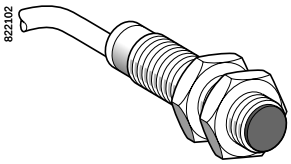

| Sensor | Pre-cabled | | | M8 connector | | | M12 connector | | |
|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | a | b | c | a | b | c |
| Ø 4 | 29 | 29 | – | 41 | 24 | – | – | – | – |
| Ø 5 | 29 | 29 | – | 41 | 24 | – | – | – | – |
| Ø 6.5 | 33 | 30 | – | 42 | 34 | – | 45 | 24 | – |
| Ø 6.5, XS2 L06●A340● | 33 | 27 | 3 | 46 | 35 | 3 | 49 | 25 | 3 |

# Inductive proximity sensors

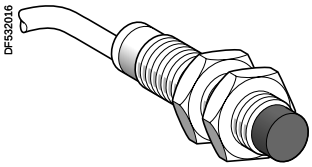
## Osiprox® Technology

Cylindrical, flush mountable and non flush mountable
Two-wire, a.c. or d.c. supply, short-circuit protection

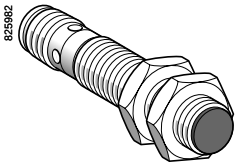




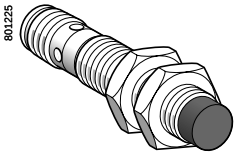

*XS1 M●●●●250*



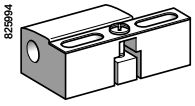

*XS2 M●●●●250*




*XS1 M●●●●250K*




*XS2 M●●●●250K*




*XSZ B1●●*

| Sensing distance Sn (mm) | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **Ø 12, threaded M12 x 1** | | | | |
| **Flush mountable** | | | | |
| **2** | NO | Pre-cabled (L = 2 m) *(1)* | **XS1 M12MA250** | 0.075 |
| | | 1/2”-20UNF connector | **XS1 M12MA250K** | 0.025 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS1 M12MB250** | 0.075 |
| | | 1/2”-20UNF connector | **XS1 M12MB250K** | 0.025 |
| **Non flush mountable** | | | | |
| **4** | NO | Pre-cabled (L = 2 m) *(1)* | **XS2 M12MA250** | 0.075 |
| | | 1/2”-20UNF connector | **XS2 M12MA250K** | 0.025 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS2 M12MB250** | 0.075 |
| **Ø 18, threaded M18 x 1** | | | | |
| **Flush mountable** | | | | |
| **5** | NO | Pre-cabled (L = 2 m) *(1)* | **XS1 M18MA250** | 0.120 |
| | | 1/2”-20UNF connector | **XS1 M18MA250K** | 0.060 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS1 M18MB250** | 0.120 |
| | | 1/2”-20UNF connector | **XS1 M18MB250K** | 0.060 |
| **Non flush mountable** | | | | |
| **8** | NO | Pre-cabled (L = 2 m) *(1)* | **XS2 M18MA250** | 0.120 |
| | | 1/2”-20UNF connector | **XS2 M18MA250K** | 0.060 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS2 M18MB250** | 0.120 |
| | | 1/2”-20UNF connector | **XS2 M18MB250K** | 0.060 |
| **Ø 30, threaded M30 x 1.5** | | | | |
| **Flush mountable** | | | | |
| **10** | NO | Pre-cabled (L = 2 m) *(1)* | **XS1 M30MA250** | 0205 |
| | | 1/2”-20UNF connector | **XS1 M30MA250K** | 0.145 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS1 M30MB250** | 0205 |
| | | 1/2”-20UNF connector | **XS1 M30MB250K** | 0.145 |
| **Non flush mountable** | | | | |
| **15** | NO | Pre-cabled (L = 2 m) *(1)* | **XS2 M30MA250** | 0205 |
| | | 1/2”-20UNF connector | **XS2 M30MA250K** | 0.145 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS2 M30MB250** | 0205 |
| | | 1/2”-20UNF connector | **XS2 M30MB250K** | 0.145 |

## Accessories *(2)*

| Description mm | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 12 | **XSZ B112** | 0.006 |
| | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

*(1) For a 5 m long cable, add **L1** to the reference and for a 10 m long cable, add **L2** to the reference. Example: **XS1 M18MA250** becomes **XS1 M18MA250L1** with a 5 m long cable.*
*(2) For further information, see page 2/106.*

# Inductive proximity sensors
## Osiprox® Technology
Cylindrical, flush mountable and non flush mountable
Two-wire, a.c. or d.c. supply, short-circuit protection



## Characteristics

| Sensor type | | | XS● M●●M●250K | XS● M●●M●250 |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | |
| **Connection** | | | 1/2"-20UNF connector | Pre-cabled, length: 2 m |
| **Operating zone** | Ø 12 flush mountable | **mm** | **0…1.6** | |
| | Ø 12 non flush mountable | **mm** | **0…3.2** | |
| | Ø 18 flush mountable | **mm** | **0…4** | |
| | Ø 18 non flush mountable | **mm** | **0…6.4** | |
| | Ø 30 flush mountable | **mm** | **0…8** | |
| | Ø 30 non flush mountable | **mm** | **0…12** | |
| **Differential travel** | | **%** | 1...15 of real sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | IP 68, double insulation |
| **Storage temperature** | | **°C** | - 40…+ 85 | |
| **Operating temperature** | | **°C** | - 25…+ 70 | |
| **Materials** | Case | | Nickel plated brass | |
| | Cable | | – | PvR 2 x 0.34 mm² |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Indicators** | Output state | | Red LED, 4 viewing ports at 90° | Red LED |
| | Supply on | | Green LED: 4 viewing ports at 90° (only on Ø 18 and Ø 30) | Green LED (only on Ø 18 and Ø 30) |
| **Rated supply voltage** | | **V** | ∼ 24…240 (50/60 Hz) or ⎓ 24…210 | |
| **Voltage limits (including ripple)** | | **V** | ∼ or ⎓ 20…264 | |
| **Switching capacity** | | **mA** | ∼ 5…300 or ⎓ 5…200 (except Ø 12: ∼ or ⎓ 5…200) with overload and short-circuit protection | |
| **Voltage drop, closed state** | | **V** | ≤ 5.5 | |
| **Current consumption, no-load** | | **mA** | – | |
| **Residual current, open state** | | **mA** | ≤ 1.5 | |
| **Maximum switching frequency** | Ø 12 | **Hz** | ∼ 25 or ⎓ 4000 | |
| | Ø 18 | **Hz** | ∼ 25 or ⎓ 2000 | |
| | Ø 30 flush mountable | **Hz** | ∼ 25 or ⎓ 2000 | |
| | Ø 30 non flush mountable | **Hz** | ∼ 25 or ⎓ 1000 | |
| **Delays** | First-up | **ms** | ≤ 70 | |
| | Response | **ms** | ≤ 0.2 for Ø 12, ≤ 2 for Ø 18 and Ø 30 | |
| | Recovery | **ms** | ≤ 0.2 for Ø 12, ≤ 4 for Ø 18, ≤ 5 for Ø 30 flush mountable, ≤ 10 for Ø 30 non flush mountable | |

## Wiring schemes

**1/2"-20UNF connector**

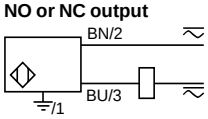

+/- : 2
⏚ : 1
+/- : 3

**Pre-cabled**

BU: Blue
BN: Brown

**2-wire ∼ or ⎓**

**NO or NC output**



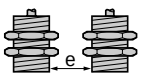

*See connection on page 9/45.*

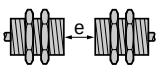
⏚: *on connector models only.*

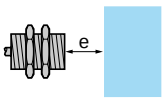
## Setting-up

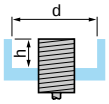
**Minimum mounting distances (mm)**

| Sensor | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| Ø 12 flush mountable | e ≥ 4 | e ≥ 24 | e ≥ 6 | d ≥ 12 h ≥ 0 |
| Ø 12 non flush mountable | e ≥ 16 | e ≥ 48 | e ≥ 12 | d ≥ 36 h ≥ 8 |
| Ø 18 flush mountable | e ≥ 10 | e ≥ 60 | e ≥ 15 | d ≥ 18 h ≥ 0 |
| Ø 18 non flush mountable | e ≥ 16 | e ≥ 96 | e ≥ 24 | d ≥ 54 h ≥ 16 |
| Ø 30 flush mountable | e ≥ 20 | e ≥ 120 | e ≥ 30 | d ≥ 30 h ≥ 0 |
| Ø 30 non flush mountable | e ≥ 60 | e ≥ 180 | e ≥ 45 | d ≥ 90 h ≥ 30 |

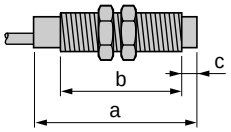



## Dimensions




| Sensor | Flush mountable in metal | | | | Non flush mountable in metal | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pre-cabled | | Connector | | Pre-cabled | | Connector | | |
| | a | b | a | b | a | b | a | b | c |
| Ø 12 | 55 | 47 | 66 | 48 | 54.6 | 42 | 65.6 | 42 | 5 |
| Ø 18 | 60 | 51 | 72 | 51 | 60 | 44 | 72 | 44 | 8 |
| Ø 30 | 60 | 51 | 72 | 51 | 62.6 | 41 | 74.7 | 41 | 13 |

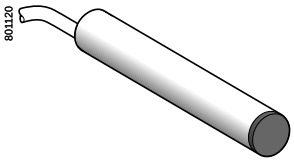
# Inductive proximity sensors

## Osiprox® Technology

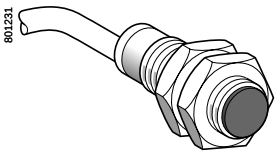
Cylindrical, metal and plastic, flush mountable and non flush mountable

Four-wire, d.c. supply, solid-state NO + NC output

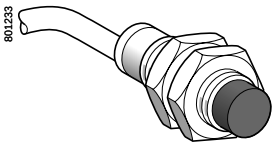




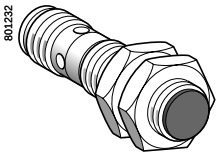

*XS1 L06●C410*



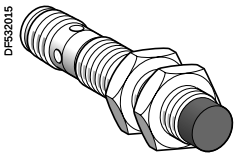

*XS1 ●●●●C410*



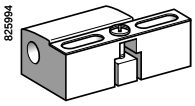

*XS2 ●●●●C410*




*XS1 N●●●C410D*




*XS2 N●●●C410D*




*XSZ B1●●*

| Sensing distance Sn (mm) | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Ø 6.5 plain** | | | | | |
| **Stainless steel case, flush mountable** | | | | | |
| **1.5** | NO + NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS1 L06PC410** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 L06NC410** | 0.025 |
| **Ø 8, threaded M8 x 1** | | | | | |
| **Stainless steel case, flush mountable** | | | | | |
| **1.5** | NO + NC | PNP | Pre-cabled (L = 2 m) | **XS1 M08PC410** | 0.035 |
| | | | M12 connector | **XS1 M08PC410D** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1 M08NC410** | 0.035 |
| | | | M12 connector | **XS1 M08NC410D** | 0.025 |
| **Stainless steel case, non flush mountable** | | | | | |
| **2.5** | NO + NC | PNP | Pre-cabled (L = 2 m) | **XS2 M08PC410** | 0.035 |
| | | | M12 connector | **XS2 M08PC410D** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) | **XS2 M08NC410** | 0.035 |
| | | | M12 connector | **XS2 M08NC410D** | 0.025 |
| **Ø 12, threaded M12 x 1** | | | | | |
| **Brass case, flush mountable** | | | | | |
| **2** | NO + NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS1 N12PC410** | 0.070 |
| | | | M12 connector | **XS1 N12PC410D** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 N12NC410** | 0.070 |
| | | | M12 connector | **XS1 N12NC410D** | 0.020 |
| **Brass case, non flush mountable** *(2)* | | | | | |
| **4** | NO + NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 N12PC410** | 0.070 |
| | | | M12 connector | **XS2 N12PC410D** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 N12NC410** | 0.070 |
| | | | M12 connector | **XS2 N12NC410D** | 0.020 |
| **Ø 18, threaded M18 x 1** | | | | | |
| **Brass case, flush mountable** | | | | | |
| **5** | NO + NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS1 N18PC410** | 0.100 |
| | | | M12 connector | **XS1 N18PC410D** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 N18NC410** | 0.100 |
| | | | M12 connector | **XS1 N18NC410D** | 0.040 |
| **Brass case, non flush mountable** *(2)* | | | | | |
| **8** | NO + NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 N18PC410** | 0.100 |
| | | | M12 connector | **XS2 N18PC410D** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 N18NC410** | 0.100 |
| | | | M12 connector | **XS2 N18NC410D** | 0.040 |
| **Ø 30, threaded M30 x 1.5** | | | | | |
| **Brass case, flush mountable** | | | | | |
| **10** | NO + NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS1 N30PC410** | 0.160 |
| | | | M12 connector | **XS1 N30PC410D** | 0.100 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 N30NC410** | 0.160 |
| | | | M12 connector | **XS1 N30NC410D** | 0.100 |
| **Brass case, non flush mountable** *(2)* | | | | | |
| **15** | NO + NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 N30PC410** | 0.160 |
| | | | M12 connector | **XS2 N30PC410D** | 0.100 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 N30NC410** | 0.160 |
| | | | M12 connector | **XS2 N30NC410D** | 0.100 |

## Accessories *(3)*

| Description mm | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 8 | **XSZ B108** | 0.006 |
| | Ø 12 | **XSZ B112** | 0.006 |
| | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

*(1) For a 5 m long cable, add **L1** to the reference and for a 10 m long cable, add **L2** to the reference. Example: **XS1 N12PC410** becomes **XS1 N12PC410L1** with a 5 m long cable.*

*(2) For a sensor with a plastic case, non flush mountable, replace 2N by 4P in the reference. Example: **XS2 N12PC410** becomes **XS4 P12PC410** with a plastic case.*

*(3) For further information, see page 2/106.*

# Inductive proximity sensors

Osiprox® Technology

Cylindrical, metal and plastic, flush mountable and non flush mountable

Four-wire, d.c. supply, solid-state NO + NC output



## Characteristics

| Sensor type | | | XS● ●●●●C410D | XS● ●●●●C410 |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | |
| **Connection** | | | M12 connector | Pre-cabled, length: 2 m |
| **Operating zone** | Ø 6.5 and Ø 8 flush mtble. | **mm** | **0…1.2** | |
| | Ø 8 non flush mountable | **mm** | **0…2** | |
| | Ø 12 flush mountable | **mm** | **0…1.6** | |
| | Ø 12 non flush mountable | **mm** | **0…3.2** | |
| | Ø 18 flush mountable | **mm** | **0…4** | |
| | Ø 18 non flush mountable | **mm** | **0…6.4** | |
| | Ø 30 flush mountable | **mm** | **0…8** | |
| | Ø 30 non flush mountable | **mm** | **0…12** | |
| **Differential travel** | | **%** | 1...15 of real sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | IP 68, double insulation (except Ø 6.5 and Ø 8: IP 67) |
| **Storage temperature** | | **°C** | - 40…+ 85 | |
| **Operating temperature** | | **°C** | - 25…+ 70 | |
| **Materials** | Case | | Nickel plated brass for XS1 N and XS2 N<br>Stainless steel, grade 303, for XS1 L06, XS1 M08 and XS2 M08<br>Plastic, PPS, for XS4 P | |
| | Cable | | – | PvR 4 x 0.34 mm² except Ø 6.5 and Ø 8: 4 x 0.08 mm² |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Output state indication** | | | Yellow LED, 4 viewing ports at 90° | Yellow LED, annular |
| **Rated supply voltage** | | **V** | ⎓ 12…24 with protection against reverse polarity | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…36 | |
| **Switching capacity** | | **mA** | ≤ 200 with overload and short-circuit protection | |
| **Voltage drop, closed state** | | **V** | ≤ 2 | |
| **Current consumption, no-load** | | **mA** | ≤ 10 | |
| **Maximum switching frequency** | Ø 6.5, Ø 8 and Ø 12 | **Hz** | 5000 | |
| | Ø 18 | **Hz** | 2000 | |
| | Ø 30 | **Hz** | 1000 | |
| **Delays** | First-up | **ms** | ≤ 5 | |
| | Response | **ms** | ≤ 0.1 for Ø 8 and Ø 12, ≤ 0.15 for Ø 18, ≤ 0.3 for Ø 30 | |
| | Recovery | **ms** | ≤ 0.1 for Ø 8 and Ø 12, ≤ 0.35 for Ø 18, ≤ 0.7 for Ø 30 | |

## Wiring schemes

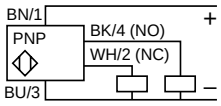
**M12 connector**


*See connection on page* 9/45.

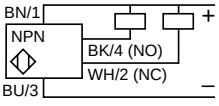
**Pre-cabled**

BU: Blue
BN: Brown
BK: Black
WH: White

**PNP 4-wire**



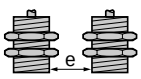

**NPN 4-wire**

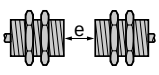


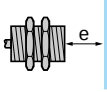

## Setting-up

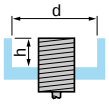
**Minimum mounting distances (mm)**

| Sensor | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| Ø 6.5 flush mountable **XS1 L06** | e ≥ 3 | e ≥ 18 | e ≥ 4.5 | d ≥ 6.5 h ≥ 0 |
| Ø 8 flush mountable **XS1 M08** | e ≥ 3 | e ≥ 18 | e ≥ 4.5 | d ≥ 8 h ≥ 0 |
| Ø 8 non flush mountable **XS2 M08** | e ≥ 10 | e ≥ 30 | e ≥ 7.5 | d ≥ 24 h ≥ 5 |
| Ø 12 flush mountable **XS1 N12** | e ≥ 4 | e ≥ 24 | e ≥ 6 | d ≥ 12 h ≥ 0 |
| Ø 12 non flush mtble **XS1 N12** or **XS4 P12** | e ≥ 16 | e ≥ 48 | e ≥ 12 | d ≥ 36 h ≥ 8 |
| Ø 18 flush mountable **XS1 N18** | e ≥ 10 | e ≥ 60 | e ≥ 15 | d ≥ 18 h ≥ 0 |
| Ø 18 non flush mtble **XS2 N18** or **XS4 P18** | e ≥ 16 | e ≥ 96 | e ≥ 24 | d ≥ 54 h ≥ 16 |
| Ø 30 flush mountable **XS1 N30** | e ≥ 20 | e ≥ 120 | e ≥ 30 | d ≥ 30 h ≥ 0 |
| Ø 30 non flush mtble **XS2 N30** or **XS4 P30** | e ≥ 60 | e ≥ 180 | e ≥ 45 | d ≥ 90 h ≥ 30 |

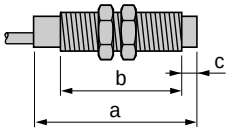



## Dimensions



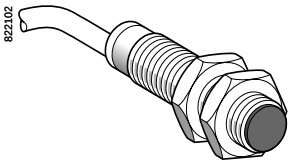

| Sensor | Flush mountable in metal | | | | Non flush mountable in metal | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pre-cabled | | Connector | | Pre-cabled | | Connector | | |
| | a | b | a | b | a | b | a | b | c |
| Ø 6.5 metal | 50 | 47 | – | – | – | – | – | – | – |
| Ø 8 metal | 50 | 42 | 61 | 42 | 50 | 36 | 61 | 36 | 4 |
| Ø 12 metal | 33 | 25 | 48 | 29 | 37.6 | 25 | 52.6 | 29 | 5 |
| Ø 12 plastic | – | – | – | – | 33 | 25 | 48 | 29 | 0 |
| Ø 18 metal | 36.5 | 28 | 48.6 | 28 | 36.5 | 20 | 48.6 | 20 | 8 |
| Ø 18 plastic | – | – | – | – | 33.5 | 26 | 48 | 29 | 0 |
| Ø 30 metal | 40.6 | 32 | 52.7 | 32 | 40.5 | 19 | 52.6 | 19 | 13 |
| Ø 30 plastic | – | – | – | – | 40.5 | 33 | 50 | 34 | 0 |

# Inductive proximity sensors

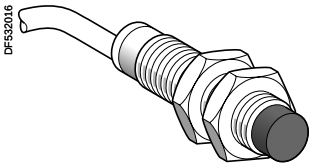
## Osiprox® Technology

Cylindrical, metal and plastic, flush and non flush mountable
Four-wire, d.c. supply, solid-state PNP + NPN
NO/NC programmable output

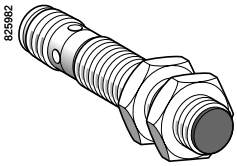




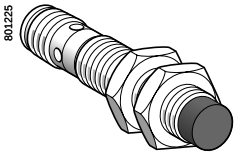

*XS1 M●●KP340*
*XS4 P●●KP340*



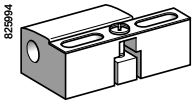

*XS2 M●●KP340*




*XS1 M●●KP340D*
*XS4 P●●KP340D*




*XS2 M●●KP340D*




*XSZ B1●●*

| Sensing distance Sn (mm) | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Ø 12, threaded M12 x 1** | | | | | |
| **Metal case, flush mountable** | | | | | |
| **2** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 M12KP340** | 0.075 |
| | | | M12 connector | **XS1 M12KP340D** | 0.025 |
| **Metal case, non flush mountable** | | | | | |
| **4** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 M12KP340** | 0.075 |
| | | | M12 connector | **XS2 M12KP340D** | 0.025 |
| **Plastic case, non flush mountable** | | | | | |
| **4** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS4 P12KP340** | 0.075 |
| | | | M12 connector | **XS4 P12KP340D** | 0.025 |
| **Ø 18, threaded M18 x 1** | | | | | |
| **Metal case, flush mountable** | | | | | |
| **5** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 M18KP340** | 0.120 |
| | | | M12 connector | **XS1 M18KP340D** | 0.060 |
| **Metal case, non flush mountable** | | | | | |
| **8** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 M18KP340** | 0.120 |
| | | | M12 connector | **XS2 M18KP340D** | 0.060 |
| **Plastic case, non flush mountable** | | | | | |
| **8** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS4 P18KP340** | 0.120 |
| | | | M12 connector | **XS4 P18KP340D** | 0.060 |
| **Ø 30, threaded M30 x 1.5** | | | | | |
| **Metal case, flush mountable** | | | | | |
| **10** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS1 M30KP340** | 0205 |
| | | | M12 connector | **XS1 M30KP340D** | 0.145 |
| **Metal case, non flush mountable** | | | | | |
| **15** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 M30KP340** | 0205 |
| | | | M12 connector | **XS2 M30KP340D** | 0.145 |
| **Plastic case, non flush mountable** | | | | | |
| **15** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS4 P30KP340** | 0205 |
| | | | M12 connector | **XS4 P30KP340D** | 0.145 |

## Accessories *(2)*

| Description mm | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 12 | **XSZ B112** | 0.006 |
| | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

*(1) For a 5 m long cable, add **L1** to the reference and for a 10 m long cable, add **L2** to the reference. Example: **XS1 M12KP340** becomes **XS1 M12KP340L1** with a 5 m long cable.*
*(2) For further information, see page 2/106.*

# Inductive proximity sensors

## Osiprox® Technology

Cylindrical, metal and plastic, flush and non flush mountable
Four-wire, d.c. supply, solid-state PNP + NPN
NO/NC programmable output



## Characteristics

| Sensor type | | | XS● M●●KP340D | XS● M●●KP340 |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | |
| **Connection** | | | M12 connector | Pre-cabled, length: 2 m |
| **Operating zone** | Ø 12 flush mountable | **mm** | **0…1.6** | |
| | Ø 12 non flush mountable | **mm** | **0…3.2** | |
| | Ø 18 flush mountable | **mm** | **0…4** | |
| | Ø 18 non flush mountable | **mm** | **0…6.4** | |
| | Ø 30 flush mountable | **mm** | **0…8** | |
| | Ø 30 non flush mountable | **mm** | **0…12** | |
| **Differential travel** | | **%** | 1...15 of real sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | IP 68, double insulation |
| **Storage temperature** | | **°C** | - 40…+ 85 | |
| **Operating temperature** | | **°C** | - 25…+ 70 | |
| **Materials** | Case | | Nickel plated brass for XS1 M and XS2 M, PPS for XS4 P | |
| | Cable | | – | PvR 4 x 0.34 mm² |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Output state indication** | | | Yellow LED, 4 viewing ports at 90° | Yellow LED, annular |
| **Rated supply voltage** | | **V** | ⎓ 12…24 with protection against reverse polarity | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…36 | |
| **Switching capacity** | | **mA** | ≤ 200 with overload and short-circuit protection | |
| **Voltage drop, closed state** | | **V** | ≤ 2.6 | |
| **Current consumption, no-load** | | **mA** | ≤ 10 | |
| **Maximum switching frequency** | Ø 12 | **Hz** | 5000 | |
| | Ø 18 | **Hz** | 2000 | |
| | Ø 30 flush mountable | **Hz** | 1000 | |
| | Ø 30 non flush mountable | **Hz** | 1000 | |
| **Delays** | First-up | **ms** | ≤ 5 | |
| | Response | **ms** | ≤ 0.1 for Ø 12, ≤ 0.15 for Ø 18, ≤ 0.3 for Ø 30 | |
| | Recovery | **ms** | ≤ 0.1 for Ø 12, ≤ 0.35 for Ø 18, ≤ 0.7 for Ø 30 | |

## Wiring schemes

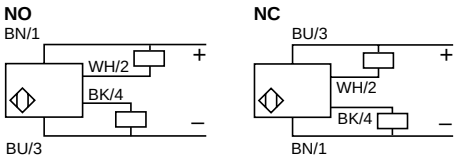
**M12 connector**


**Pre-cabled**

BU: Blue
BN: Brown
BK: Black
WH: White

**PNP + NPN**

**4-wire programmable, NO or NC output**



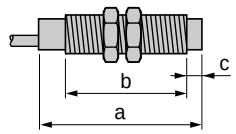

*See connection on page* 9/45.

## Setting-up

**Minimum mounting distances (mm)**

| Sensor | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| Ø 12 flush mountable **XS1 M12** | e ≥ 4 | e ≥ 24 | e ≥ 6 | d ≥ 12 h ≥ 0 |
| Ø 12 non flush mountable **XS2 M12** and **XS4 P12** | e ≥ 16 | e ≥ 48 | e ≥ 12 | d ≥ 36 h ≥ 8 |
| Ø 18 flush mountable **XS1 M18** | e ≥ 10 | e ≥ 60 | e ≥ 15 | d ≥ 18 h ≥ 0 |
| Ø 18 non flush mountable **XS2 M18** and **XS4 P18** | e ≥ 16 | e ≥ 96 | e ≥ 24 | d ≥ 54 h ≥ 16 |
| Ø 30 flush mountable **XS1 M30** | e ≥ 20 | e ≥ 120 | e ≥ 30 | d ≥ 30 h ≥ 0 |
| Ø 30 non flush mountable **XS2 M30** and **XS4 P30** | e ≥ 60 | e ≥ 180 | e ≥ 45 | d ≥ 90 h ≥ 30 |

## Dimensions




| Sensor | Flush mountable in metal | | | | Non flush mountable in metal | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pre-cabled | | Connector | | Pre-cabled | | Connector | | |
| | a | b | a | b | a | b | a | b | c |
| Ø 12 metal | 50 | 42 | 61 | 42 | 54.6 | 42 | 65.6 | 42 | 5 |
| Ø 12 plastic | – | – | – | – | 50 | 42 | 61 | 42 | 0 |
| Ø 18 metal | 60 | 51 | 72 | 51 | 60 | 44 | 72 | 44 | 8 |
| Ø 18 plastic | – | – | – | – | 60 | 51 | 70 | 51 | 0 |
| Ø 30 metal | 60 | 51 | 72 | 51 | 62.6 | 41 | 74.7 | 41 | 13 |
| Ø 30 plastic | – | – | – | – | 60 | 51 | 70 | 51 | 0 |

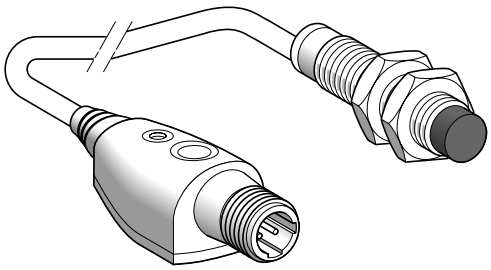
# Inductive proximity sensors

## Osiprox® Universal, **Osi**concept® *(1)*

Cylindrical, flush mountable or non flush mountable
Three-wire, d.c. supply, solid-state output



520030



*XS6 ●●B2●●L01M12*

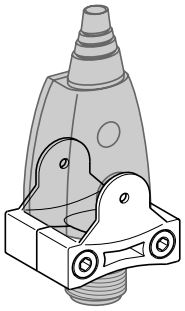
### Ø 12, threaded M12 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **5** | NO | PNP | 0.15 m flying lead with M12 connector | **XS6 12B2PAL01M12** | 0.100 |
| | | NPN | 0.15 m flying lead with M12 connector | **XS6 12B2NAL01M12** | 0.100 |
| | NC | PNP | 0.15 m flying lead with M12 connector | **XS6 12B2PBL01M12** | 0.100 |
| | | NPN | 0.15 m flying lead with M12 connector | **XS6 12B2NBL01M12** | 0.100 |

### Ø 18, threaded M18 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **9** | NO | PNP | 0.15 m flying lead with M12 connector | **XS6 18B2PAL01M12** | 0.140 |
| | | NPN | 0.15 m flying lead with M12 connector | **XS6 18B2NAL01M12** | 0.140 |
| | NC | PNP | 0.15 m flying lead with M12 connector | **XS6 18B2PBL01M12** | 0.140 |
| | | NPN | 0.15 m flying lead with M12 connector | **XS6 18B2NBL01M12** | 0.140 |

520031

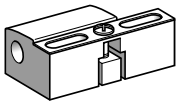


*XSZ BPM12*

### Ø 30, threaded M30 x 1.5

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **18** | NO | PNP | 0.15 m flying lead with M12 connector | **XS6 30B2PAL01M12** | 0.220 |
| | | NPN | 0.15 m flying lead with M12 connector | **XS6 30B2NAL01M12** | 0.220 |
| | NC | PNP | 0.15 m flying lead with M12 connector | **XS6 30B2PBL01M12** | 0.220 |
| | | NPN | 0.15 m flying lead with M12 connector | **XS6 30B2NBL01M12** | 0.220 |

825994



*XSZ B●●●*

### Accessories (2)

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Remote control fixing clamp** | | **XSZ BPM12** | 0.015 |
| **Sensor fixing clamps** | Ø 12 | **XSZ B112** | 0.006 |
| | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

*(1) For further information on **Osi**concept®, see page 2/20.*
*(2) For further information, see page 2/106.*

# Inductive proximity sensors

## Osiprox® Universal, **Osi**concept® (1)

Cylindrical, flush mountable or non flush mountable
Three-wire, d.c. supply, solid-state output



## Characteristics

| Sensor type | | | | XS6 ●●B2●●L01M12 |
|---|---|---|---|---|
| **Product certifications** | | | | UL, CSA, CE |
| **Connection** | Connector | | | 0.15 m flying lead with M12 connector |
| **Sensing distance and adjustment zone** | Ø 12 | Nominal sensing distance Sn | **mm** | **0…5** non flush mounted configuration / **0…3.4** flush mounted configuration |
| | | Fine adjustment zone | **mm** | **1.7…5** non flush mounted configuration / **1.7…3.4** flush mounted configuration |
| | Ø 18 | Nominal sensing distance Sn | **mm** | **0…9** non flush mounted configuration / **0…6** flush mounted configuration |
| | | Fine adjustment zone | **mm** | **3…9** non flush mounted configuration / **3…6** flush mounted configuration |
| | Ø 30 | Nominal sensing distance Sn | **mm** | **0…18** non flush mounted configuration / **0…11** flush mounted configuration |
| | | Fine adjustment zone | **mm** | **6…18** non flush mounted configuration / **6…11** flush mounted configuration |
| **Differential travel** | | | **%** | 1…15 of real sensing distance (Sr) |
| **Degree of protection** | Conforming to IEC 60529 | | | IP 67 ⧈ |
| **Storage temperature range** | | | **°C** | - 40…+ 85 |
| **Operating temperature range** | | | **°C** | - 25…+ 70 |
| **Materials** | Case | | | Nickel plated brass |
| | Remote control | | | PBT |
| | Pre-cabled | | | PvR - Ø 4.2 mm |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | | 50 gn, duration 11 ms |
| **Indicator** | Output state | | | Yellow LED |
| | Supply on and teach mode | | | Green LED |
| **Rated supply voltage** | | | **V** | ⎓ 12…24 with protection against reverse polarity |
| **Voltage limits (including ripple)** | | | **V** | ⎓ 10…36 |
| **Switching capacity** | | | **mA** | ≤ 100 with overload and short-circuit protection |
| **Voltage drop, closed state** | | | **V** | ≤ 2 |
| **Current consumption, no-load** | | | **mA** | ≤ 10 |
| **Maximum switching frequency** | | | **Hz** | 1000 |
| **Delays** | First-up | | **ms** | ≤ 10 |
| | Response | | **ms** | ≤ 0.3 |
| | Recovery | | **ms** | ≤ 0.7 |

*(1) For further information on **Osi**concept®, see page 2/20.*

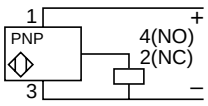
## Wiring scheme

**Connector**

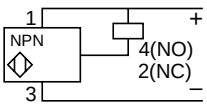
M12


*See connection on page 9/45.*

**PNP**

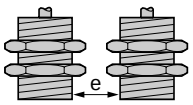


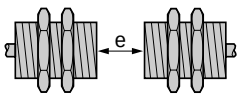

**NPN**

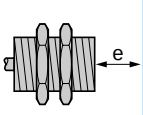



## Setting-up

**Minimum mounting distances (mm)**



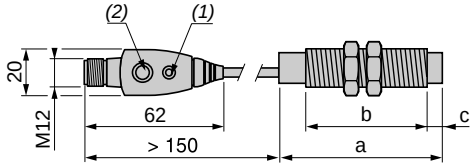




| | Side by side flush mounted | Side by side non flush mounted | Face to face flush mounted | Face to face non flush mounted | Facing a metal object |
|---|---|---|---|---|---|
| Ø 12 | e ≥ 14 | 50 | e ≥ 50 | 100 | e ≥ 3.4 |
| Ø 18 | e ≥ 28 | 100 | e ≥ 100 | 200 | e ≥ 6 |
| Ø 30 | e ≥ 48 | 180 | e ≥ 180 | 360 | e ≥ 11 |

## Dimensions

**XS6**



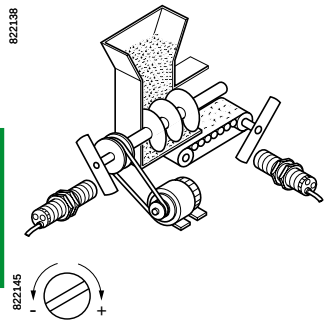

*(1) LED*
*(2) Teach mode button*

| | Connector (mm) a | b | c |
|---|---|---|---|
| Ø 12 | 54.6 | 42 | 5 |
| Ø 18 | 60 | 44 | 8 |
| Ø 30 | 62.6 | 41 | 13 |

# Inductive proximity sensors
## Osiprox® Application
### Sensors for rotation monitoring, slip detection, shaft overload detection
### Cylindrical type



**Example:**
Coupling breakage monitoring




## Functions

These self-contained rotation speed monitoring sensors have the special feature of incorporating, in the same case, the pulse sensing and processing electronics as well as the output switching amplifier that are required to establish an integrated rotation monitoring device.

The unit provides an economical solution for detecting slip, belt breakage, drive shaft shear and overloading, etc., in the following applications: conveyor belts, bucket elevators, Archemedian screws, grinders, crushers, pumps, centrifugal driers, mixers, etc.

## Operating principle

The output signal of this type of sensor is processed by an impulse comparator incorporated in the sensor. The impulse frequency Fc generated by the moving part to be monitored is compared to the frequency Fr preset on the sensor. The output switching circuit of the sensor is in the closed state for Fc > Fr and the open state for Fc < Fr.

Sensors XSA-V are particularly suitable for the detection of underspeed: when the speed of the moving part Fc falls below a preset threshold Fr, this causes the output circuit of the sensor to switch off.

***Note:** following power-up, the operational status of the sensor is subject to a delay of 9 seconds in order for the moving part being monitored to run-up to its nominal speed. During this time, the output of the sensor remains in the closed state.*

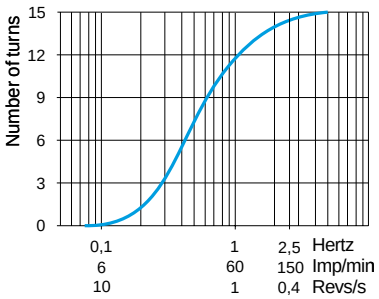
**Adjustment of frequency threshold**

- Adjustment of sensor's frequency threshold: using potentiometer, 15 turns approximately.
- To increase the frequency threshold: turn the adjustment screw clockwise (+).
- To decrease the frequency threshold: turn the adjustment screw anti-clockwise (–).

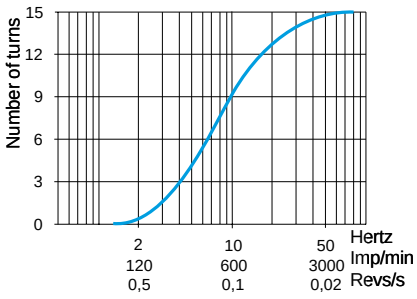
| | Diameter of sensor | | |
|---|---|---|---|
| Potentiometer | | | |
| LED | a | b | c |
| Metal target | M30 | 4…6 mm | 30 mm | 60 mm |

**Potentiometer adjustment curves** (for **XSA V1●801**, 2-wire ∿ or ⎓ sensors)

Low speed version (6…150 impulses/minute)



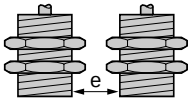

High speed version (120…3000 impulses/minute)




## Setting-up

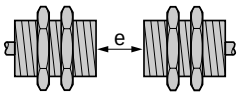
Minimum mounting distances (mm)

Side by side



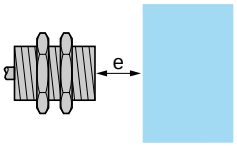

e ≥ 20

Face to face



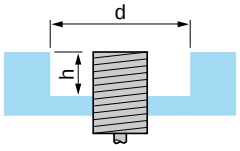

e ≥ 120

Facing a metal object




e ≥ 30

Mounted in a metal support




d ≥ 30, h ≥ 0

Fixing nut tightening torque: < 50 N.m

# Inductive proximity sensors

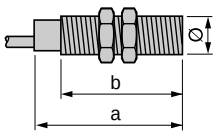
## Osiprox® Application

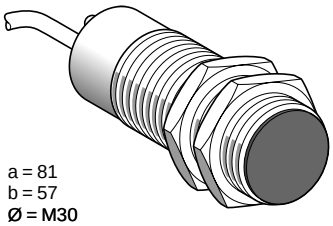
Sensors for rotation monitoring, slip detection, shaft overload detection

Cylindrical type



## Flush mountable in metal



Lengths (mm):
a = Overall
b = Threaded section

a = 81
b = 57
Ø = M30

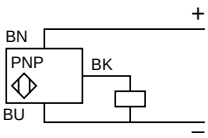
| | | DC | DC | AC/DC | AC/DC |
|---|---|---|---|---|---|
| **Nominal sensing distance** (Sn) | | 10 mm | 10 mm | 10 mm | 10 mm |
| **Adjustable frequency range** | | 6…150 impulses/min | 120…3000 impulses/min | 6…150 impulses/min | 120…3000 impulses/min |
| **References** | | | | | |
| **3-wire** ⎓ | **PNP / NC** | **XSA V11373** | **XSA V12373** | – | – |
| **2-wire** | **⎓ or ∿ / NC** | – | – | **XSA V11801** | **XSA V12801** |
| **Weight** (kg) | | 0.300 | | | |

## Characteristics

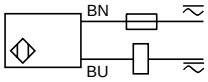
| | | |
|---|---|---|
| **Connection** | Pre-cabled, 3 x 0.34 mm², length 2 m *(1)* | Pre-cabled, 2 x 0.34 mm², length 2 m *(1)* |
| **Degree of protection** conforming to IEC 60529 | IP 67 | |
| **Operating zone** | 0…8 mm | |
| **Repeat accuracy** | 3% of Sr | |
| **Differential travel** | 3…15% of Fr | |
| **Operating temperature** | - 25…+ 70 °C | |
| **Output state indication** | Red LED | |
| **Rated supply voltage** | **⎓ 12…48 V with protection against reverse polarity** | **∿ 24…240 V (50/60 Hz) or ⎓ 24…210 V** |
| **Voltage limits (including ripple)** | ⎓ 10…58 V | ∿ or ⎓ 20…264 V |
| **Switching capacity** | **≤ 200 mA with overload and short-circuit protection** | **∿ 5…350 mA or ⎓ 5…200 mA** *(2)* |
| **Voltage drop, closed state** | ≤ 1.8 V | ≤ 5.7 V |
| **Residual current, open state** | – | ≤ 1.5 mA |
| **Current consumption, no-load** | ≤ 15 mA | – |
| **Maximum switching frequency** | 6 000 impulses/min (for **XSA V11●●●**); 48 000 impulses/min (for **XSA V12●●●**) | |
| **"Run-up" delay following power-up** | 9 seconds ± 20% + 1/Fr (3) | |

## Wiring schemes

3-wire ⎓
XSA V1●**373**




2-wire ∿ or ⎓
**XSA V1●801**




*(1) For a 5 m long cable add L05 to the reference, for a 10 m long cable add L10 to the reference.*
*Example: XSA V11373 becomes **XSA V11373L05** with a 5 m long cable.*

*(2) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A "quick-blow" fuse in series with the load, see page 2/106.*

*(3) For a sensor without a "run-up" delay following power-up, replace XSA V1 in the reference by XSA V0.*
*Example: XSA V11801 becomes **XSA V01801** without a "run-up" delay. For a reduced "run-up" delay of 3 s, replace XSA V1 in the reference by XSA V3.*

Accessories:
page 2/106

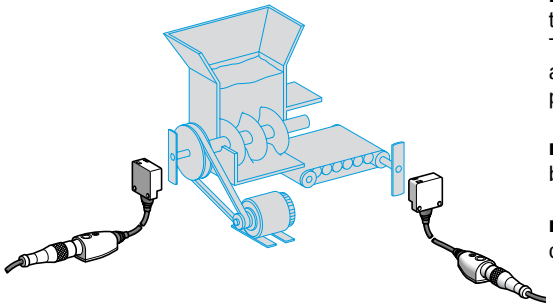
# Inductive proximity sensors

## Osiprox® Application

Sensors for rotation monitoring, slip detection, and shaft overload detection with teach mode



## Operating principle and applications

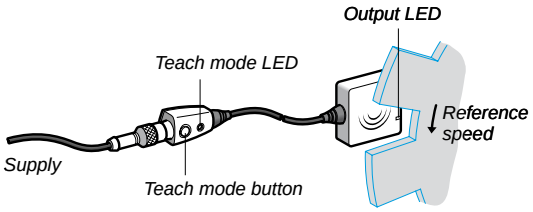


■ These inductive proximity sensors are designed for monitoring rotational speed or the speed of the flow of objects to be monitored or protected.
They operate on the principle of comparing a speed threshold preset by the operator against the instantaneous measurement of the speed of the moving object to be protected.

■ They provide a simple, economical solution to the problems of detecting slip, belt breakage, coupling and overloading, etc.

■ They are commonly used in grinder/crusher, mixer, pump, centrifugal driver, conveyor belt, bucket elevator, Archimedian screw, etc. type applications.

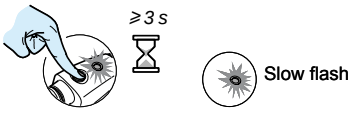
## Installation and setting-up

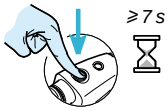



### Setting-up and positioning the sensor

■ In the positioning phase, the XS9 sensor can operate as a standard inductive sensor (Schneider Electric patent pending).
Operation in inductive mode enables validation of reliable detection of all the moving objects to be monitored.

■ Through this system, the positioning is thus made 100 % reliable and able to be checked at any time without modifying the sensor's adjustment.




### Speed adjustment in teach mode

■ The normal or reference speed of the moving object (1) to be monitored is adjusted by simply pressing the teach mode button (*2*) and is then validated by the display LED.

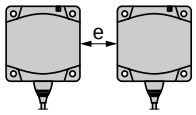
□ If in doubt, the sensor can be reset at any time to the factory settings.

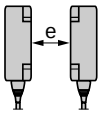
*(1) To allow the moving object to reach its normal speed (machine inertia), the sensor holds its output closed for 9 seconds.*

*(2) The sensor's default drop-out underspeed corresponds to the preset speed - 30 %.*
*Example: if the preset speed is 1000 rpm, the sensor drops out at underspeed when the speed of the moving object drops below 1000 - (1000 x 0.3) = 700 rpm.*
*- 20 %, - 11 % and - 6 % threshold can be obtained by pressing the teach mode button.*

## Setting-up

### Minimum mounting distances (mm)

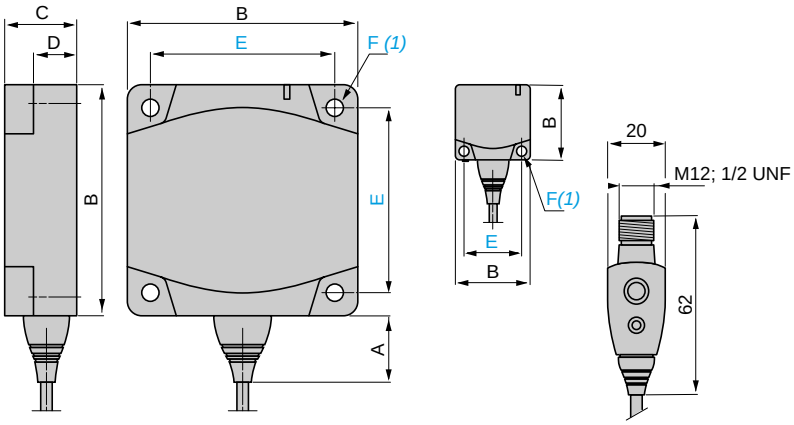



| Type | Side by side | Face to face |
|---|---|---|
| XS9 E | e ≥ 40 | e ≥ 80 |
| XS9 C | e ≥ 60 | e ≥ 120 |

## Dimensions

### XS9 E, XS9 C




*(1) For CHC type screws*

| Type | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| XS9 E | 14 | 26 | 13 | 8.8 | 20 | 3.5 |
| XS9 C | 14 | 40 | 15 | 9.8 | 33 | 4.5 |

# Inductive proximity sensors

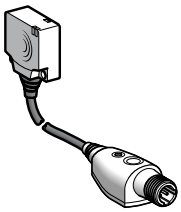
## Osiprox® Application

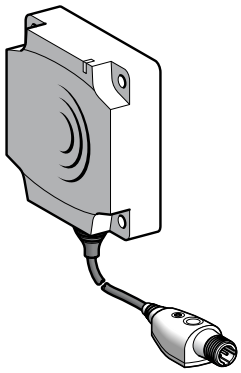
Sensors for rotation monitoring, slip detection, and shaft overload detection with teach mode



**Flush mountable in metal**

**PBT case**





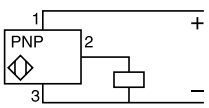
| | | | | | |
|---|---|---|---|---|---|
| **Nominal sensing distance (Sn)** | | **10 mm** | **15 mm** | **10 mm** | **15 mm** |
| **Adjustable frequency range** | | 6…6000 impulses/min | | | |
| **References** | | | | | |
| **3-wire** | PNP / NC | **XS9 E11RPBL01M12** | **XS9 C11RPBL01M12** | – | – |
| **2-wire** | ⎓ or ∿ / NC | – | – | **XS9 E11RMBL01U20** | **XS9 C11RMBL01U20** |
| **Weight (kg)** | | 0.040 | 0.060 | 0.040 | 0.060 |
| **Characteristics** | | | | | |
| **Product certifications** | | UL, CSA, CE | | | |
| **Connection** | | 0.15 m flying lead with M12 connector | | 0.15 m flying lead with 1/2" - 20 UNF connector | |
| **Operating zone** | | **0…8 mm** | **0…12 mm** | **0…8 mm** | **0…12 mm** |
| **Degree of protection** | Conforming to IEC 60529 | IP 67 double insulation ⧈ | | | |
| **Storage temperature range** | | - 40…+ 85 °C | | | |
| **Operating temperature range** | | - 25…+ 70 °C | | | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | 50 gn, duration 11 ms | | | |
| **Indicator** | Output state | Yellow LED | | | |
| | Supply on | Green LED | | | |
| **Rated supply voltage** | | ⎓ 12…24 V | | ∿ or ⎓ 24…240 V (50/60 Hz) | |
| **Voltage limits (including ripple)** | | ⎓ 10…36 V | | ∿ or ⎓ 20…264 V | |
| **Switching capacity** | | ⩽ 100 mA *(1)* | ⩽ 200 mA *(1)* | ∿ or ⎓ 5…100 mA *(2)* | ⎓ 5…200 mA, ∿ 5…300 mA*(2)* |
| **Voltage drop, closed state** | | ⩽ 2 V | | ⩽ 5.5 V | |
| **Residual current, open state** | | ⩽ 100 mA | | ⩽ 1.5 mA | |
| **Current consumption, no-load** | | ⩽ 10 mA | | – | |
| **Maximum switching frequency** | | 48 000 impulses/min | | | |
| **Power on "run-up" delay** | | 9 seconds + 1/Fr | | | |

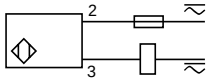
*(1) With overload and short-circuit protection.*
*(2) It is essential to connect a 0.4 A quick-blow fuse in series with the load.*

## Wiring scheme

| **Connector** | | **3-wire ⎓** | **2-wire ∿ or ⎓** |
|---|---|---|---|
| **M12** | **1/2" UNF** | **XS9 ●11RPBL01M12** | **XS9 ●11RMBL01U20** |

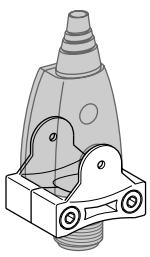





*See connection on page 9/45.*

## Accessory *(1)*



*XSZ BPM12*

| **Description** | **Reference** | **Weight kg** |
|---|---|---|
| **Remote control fixing clamp** | **XSZ BPM12** | 0.015 |

*(1) For accessories, see page 2/106.*

# Inductive proximity sensors

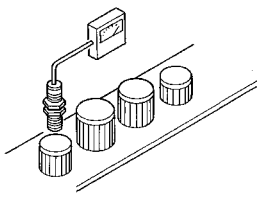
## Osiprox® Application

Sensors with analogue output signal 0...10 V *(1)* or 4…20 mA



## Functions

Example:
Sorting parts



These analogue output proximity sensors are solid-state sensors designed for monitoring displacement. They are not measuring sensors.
They are suitable for use in numerous sectors, particularly for applications involving:

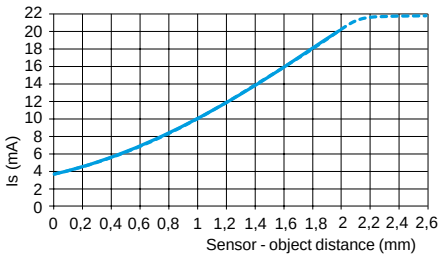
- deformation and displacement monitoring,
- vibration amplitude and frequency monitoring,
- control of dimensional tolerances,
- position control,
- concentricity or eccentricity monitoring.

## Operating principle

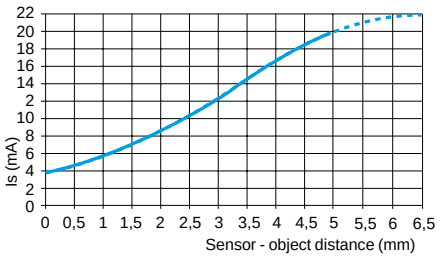
The operating principle of the sensor is that of a damped oscillator. The degree of damping will depend on the distance of an object from the sensing face. The sensor will sense the distance and produce an output current with a value directly proportional to this distance.

## Output curves 4...20 mA, 2-wire connection

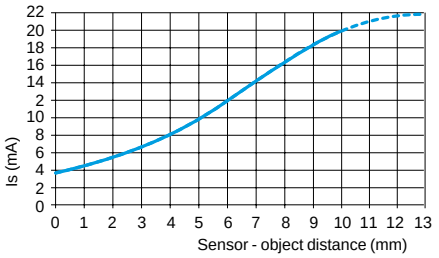
**XS1 M12AB120**
Sn = 0.2…2 mm **Ø 12 mm**



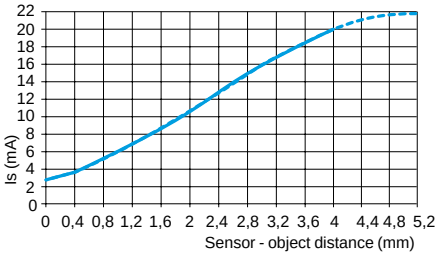

**XS1 M18AB120**
Sn = 0.5…5 mm **Ø 18 mm**



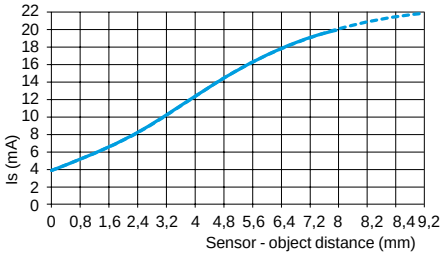

**XS1 M30AB120**
Sn = 1…10 mm **Ø 30 mm**



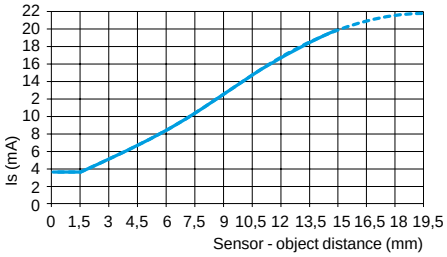

**XS4 P12AB120**
Sn = 0.4…4 mm **Ø 12 mm**




**XS4 P18AB120**
Sn = 0.8…8 mm **Ø 18 mm**

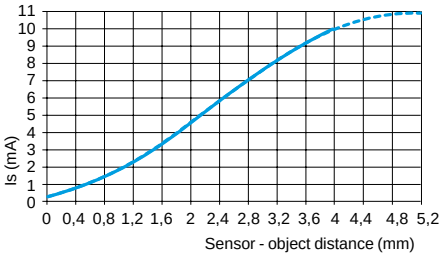



**XS4 P30AB120**
Sn = 1.5…15 mm **Ø 30 mm**

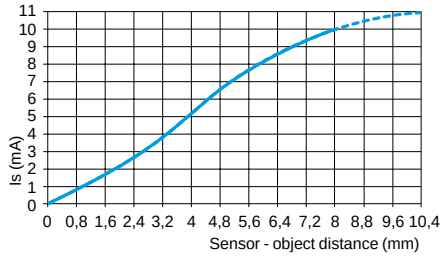



## Output curves 0...10 V, 3-wire connection

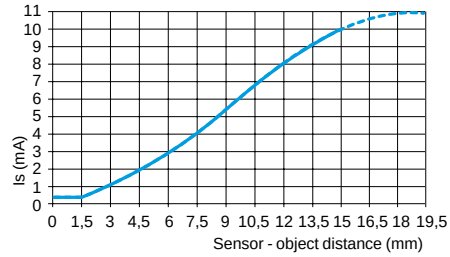
**XS4 P12AB110**
Sn = 0.4…4 mm **Ø 12 mm**




**XS4 P18AB110**
Sn = 0.4…4 mm **Ø 18 mm**

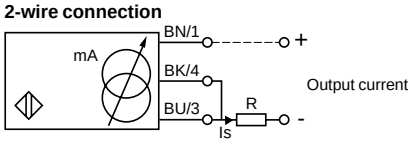



**XS4 P30AB110**
Sn = 0.4…4 mm **Ø 30 mm**

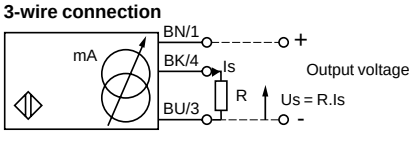



## Wiring schemes

**2-wire connection**




**3-wire connection**




| | Output current | Load impedance value |
|---|---|---|
| 12 V | 4…20 mA | R ⩽ 8.2 Ω |
| 24 V | 4…20 mA | R ⩽ 470 Ω |

Ensure a minimum of 10 V between the + and the - (terminal 3) of the sensor.

| | Output current | Load impedance value | Output voltage | Load impedance value |
|---|---|---|---|---|
| 24 V | 0…10 mA | R ⩽ 1500 Ω | 0…10 V | R = 1000 Ω |
| 48 V | 0…10 mA | R ⩽ 3300 Ω | 0…10 V | R = 1000 Ω |

Ensure a minimum of 5 V between the + and the sensor output (terminal 4).

*(1) Voltage range only obtained with a load impedance of 1000 Ω.*

References:
pages 2/69 to 2/71

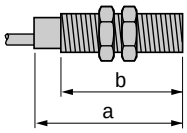
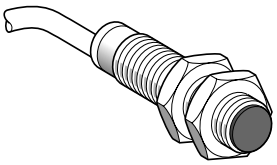
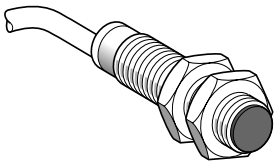
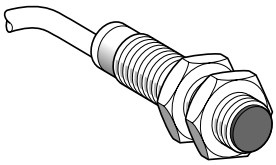
Characteristics:
pages 2/69 to 2/71

# Inductive proximity sensors

## Osiprox® Application

Sensors with analogue output signal 0...10 V *(1)* or 4…20 mA



| Sensor | Flush mountable in metal | Non flush mountable in metal | |
|---|---|---|---|
|  |  |  |  |
| Lengths (mm):<br>a = Overall<br>b = Threaded section | a = 50<br>b = 42 | a = 50<br>b = 42 | a = 50<br>b = 42 |
| | **Metal case** | **Plastic case** | **Plastic case** |
| **Nominal sensing distance** (Sn) | 2 mm | 4 mm | 4 mm |

## References

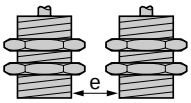
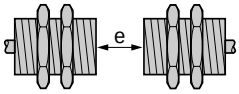
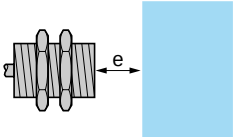
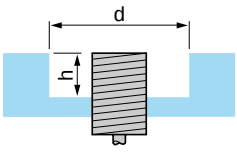
| | | | | |
|---|---|---|---|---|
| 3-wire ⎓ | Output 0…10 V *(2)* | – | – | **XS4 P12AB110** |
| 2-wire ⎓ | Output 4…20 mA *(2)* | **XS1 M12AB120** | **XS4 P12AB120** | – |
| Weight (kg) | | 0.075 | 0.065 | 0.065 |

## Characteristics

| | | | |
|---|---|---|---|
| **Product certifications** | CE, UL, CSA | | |
| **Connection** | **Pre-cabled, PvR, 3 x 0.34 mm², length 2 m** | | |
| **Degree of protection** conforming to IEC 60529 | IP 67 | | |
| **Operating zone** | **0.2…2 mm** | **0.4…4 mm** | **0.4…4 mm** |
| **Repeat accuracy** | ± 3% | | |
| **Linearity error** | ± 2 mA | | ± 1 V |
| **Ambient air temperature** | For operation: - 25…+ 70 °C | | |
| **Rated supply voltage** | ⎓ **12...24 V** | ⎓ **12...24 V** | ⎓ **24…48 V** |
| **Voltage limits (including ripple)** | ⎓ 10…38 V | ⎓ 10…38 V | ⎓ 15…58 V |
| **Output current drift** Ambient temperature: - 25…+ 70 °C | ≤ 10% | | |
| **Current consumption, no-load** | 4 mA | | |
| **Maximum operating rate** | 1500 Hz | | |

*(1) Voltage range only obtained with a load impedance of 1000 Ω.*
*(2) Output current range Is, see page 2/68.*

## Setting-up

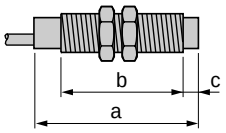
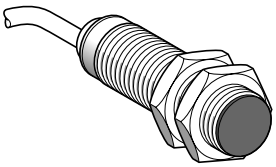
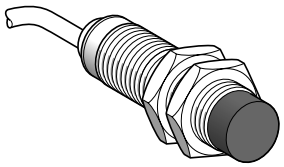
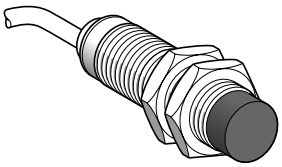
| **Minimum mounting distances (mm)** | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| |  |  |  |  |
| **XS1 M12AB120 flush mountable** | e ≥ 4 | e ≥ 24 | e ≥ 6 | d ≥ 12, h ≥ 0 |
| **XS4 P12AB110 non flush mountable** | e ≥ 16 | e ≥ 48 | e ≥ 12 | d ≥ 36, h ≥ 8 |
| **XS4 P12AB120 non flush mountable** | e ≥ 16 | e ≥ 48 | e ≥ 12 | d ≥ 36, h ≥ 8 |

| | |
|---|---|
| **Fixing nut tightening torque** | < 6 N.m (metal case), < 2 N.m (plastic case) |
| **Other versions** | Please consult your Regional Sales office. |

Accessories: page 2/106
Schemes: page 2/68

# Inductive proximity sensors
## Osiprox® Application
Sensors with analogue output signal 0...10 V *(1)* or 4…20 mA



| Sensor | Flush mountable in metal | Non flush mountable in metal | |
|---|---|---|---|
|  |  |  |  |
| Lengths (mm):<br>a = Overall<br>b = Threaded section<br>c = For non flush mountable sensors | a = 52.5<br>b = 44<br>c = 0 | a = 40.6<br>b = 26<br>c = 8 | a = 40.6<br>b = 26<br>c = 8 |
| | **Metal case** | **Plastic case** | **Plastic case** |
| **Nominal sensing distance** (Sn) | 5 mm | 8 mm | 8 mm |

## References

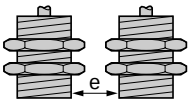
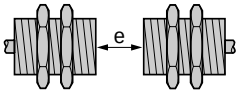
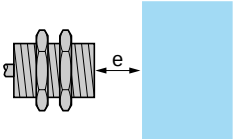
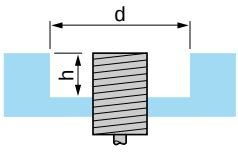
| | | | | |
|---|---|---|---|---|
| 3-wire ⎓ | Output 0…10 V *(2)* | – | – | **XS4 P18AB110** |
| 2-wire ⎓ | Output 4…20 mA *(2)* | **XS1 M18AB120** | **XS4 P18AB120** | – |
| Weight (kg) | | 0.120 | 0.080 | 0.080 |

## Characteristics

| | | | |
|---|---|---|---|
| **Product certifications** | CE, UL, CSA | | |
| **Connection** | **Pre-cabled, PvR, 3 x 0.34 mm², length 2 m** | | |
| **Degree of protection** conforming to IEC 60529 | IP 67 | | |
| **Operating zone** | **0.5…5 mm** | **0.8…8 mm** | **0.8…8 mm** |
| **Repeat accuracy** | ± 3% | | |
| **Linearity error** | ± 2 mA | | ± 1 V |
| **Ambient air temperature** | For operation: - 25…+ 70 °C | | |
| **Rated supply voltage** | ⎓ **12...24 V** | ⎓ **12...24 V** | ⎓ **24…48 V** |
| **Voltage limits (including ripple)** | ⎓ 10…38 V | ⎓ 10…38 V | ⎓ 15…58 V |
| **Output current drift** Ambient temperature: - 25…+ 70 °C | ≤ 10% | | |
| **Current consumption, no-load** | 4 mA | | |
| **Maximum operating rate** | 500 Hz | | |

*(1) Voltage range only obtained with a load impedance of 1000 Ω.*
*(2) Output current range Is, see page 2/68.*

## Setting-up

| **Minimum mounting distances (mm)** | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| |  |  |  |  |
| **XS1 M18AB120 flush mountable** | e ≥ 10 | e ≥ 60 | e ≥ 15 | d ≥ 18, h ≥ 0 |
| **XS4 P18AB110 non flush mountable** | e ≥ 32 | e ≥ 96 | e ≥ 24 | d ≥ 54, h ≥ 16 |
| **XS4 P18AB120 non flush mountable** | e ≥ 32 | e ≥ 96 | e ≥ 24 | d ≥ 54, h ≥ 16 |

| | |
|---|---|
| **Fixing nut tightening torque** | < 15 N.m (metal case), < 5 N.m (plastic case) |
| **Other versions** | Please consult your Regional Sales office. |

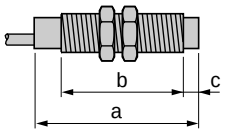
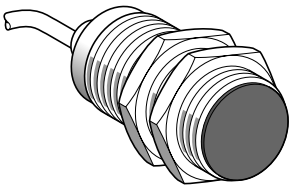
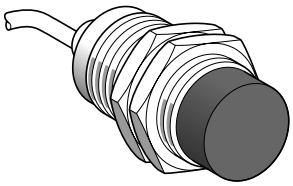
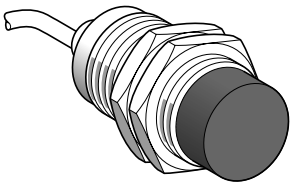
Accessories: page 2/106
Schemes: page 2/68

# Inductive proximity sensors

## Osiprox® Application

Sensors with analogue output signal 0...10 V *(1)* or 4…20 mA



| Sensor | Flush mountable in metal | Non flush mountable in metal | |
|---|---|---|---|
|  |  |  |  |
| Lengths (mm):<br>a = Overall<br>b = Threaded section<br>c = For non flush mountable sensors | a = 50<br>b = 42<br>c = 0 | a = 52.6<br>b = 32<br>c = 13 | a = 52.6<br>b = 32<br>c = 13 |
| | **Metal case** | **Plastic case** | **Plastic case** |
| **Nominal sensing distance** (Sn) | 10 mm | 15 mm | 15 mm |

### References

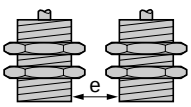
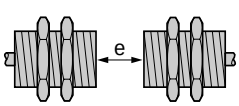
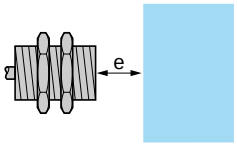
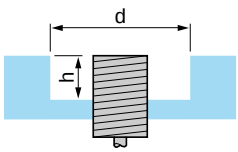
| | | | | |
|---|---|---|---|---|
| 3-wire ⎓ | Output 0…10 V *(2)* | – | – | **XS4 P30AB110** |
| 2-wire ⎓ | Output 4…20 mA *(2)* | **XS1 M30AB120** | **XS4 P30AB120** | – |
| Weight (kg) | | 0.200 | 0.100 | 0.100 |

### Characteristics

| | | | |
|---|---|---|---|
| **Product certifications** | CE, UL, CSA | | |
| **Connection** | **Pre-cabled, PvR, 3 x 0.34 mm², length 2 m** | | |
| **Degree of protection** conforming to IEC 60529 | IP 67 | | |
| **Operating zone** | **1…10 mm** | **1.5…15 mm** | **1.5…15 mm** |
| **Repeat accuracy** | ± 3% | | |
| **Linearity error** | ± 2 mA | | ± 1 V |
| **Ambient air temperature** | For operation: - 25…+ 70 °C | | |
| **Rated supply voltage** | ⎓ **12...24 V** | ⎓ **12...24 V** | ⎓ **24…48 V** |
| **Voltage limits (including ripple)** | ⎓ 10…38 V | ⎓ 10…38 V | ⎓ 15…58 V |
| **Output current drift** Ambient temperature: - 25…+ 70 °C | ≤ 10% | | |
| **Current consumption, no-load** | 4 mA | | |
| **Maximum operating rate** | 300 Hz | | |

*(1) Voltage range only obtained with a load impedance of 1000 Ω.*
*(2) Output current range Is, see page 2/68.*

### Setting-up

| **Minimum mounting distances (mm)** | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| |  |  |  |  |
| **XS1 M30AB120 flush mountable** | e ≥ 20 | e ≥ 120 | e ≥ 30 | d ≥ 30, h ≥ 0 |
| **XS4 P30AB110 non flush mountable** | e ≥ 60 | e ≥ 180 | e ≥ 45 | d ≥ 90, h ≥ 30 |
| **XS4 P30AB120 non flush mountable** | e ≥ 60 | e ≥ 180 | e ≥ 45 | d ≥ 90, h ≥ 30 |

| | |
|---|---|
| **Fixing nut tightening torque** | < 40 N.m (metal case), < 20 N.m (plastic case) |
| **Other versions** | Please consult your Regional Sales office. |

Accessories: page 2/106
Schemes: page 2/68

# Inductive proximity sensors
## Osiprox® Application
## Sensors with analogue output signal 0…10 V *(1)*



## Functions

These analogue output proximity sensors are solid-state sensors designed for monitoring displacement. They are not measuring sensors.

**They are suitable for use in numerous sectors, particularly for applications involving:**

- deformation and displacement monitoring,
- vibration amplitude and frequency monitoring,
- control of dimensional tolerances,
- position control,
- concentricity or eccentricity monitoring.

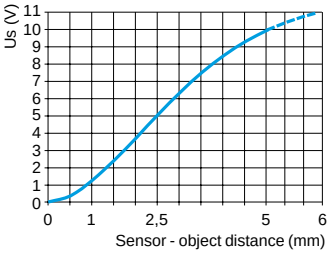
## Operating principle

The operating principle of the sensor is that of a damped oscillator. The degree of damping will depend on the distance of an object from the sensing face. The sensor will sense the distance and produce an output current with a value directly proportional to this distance.

## Output curves 0…10 V, 3-wire connection

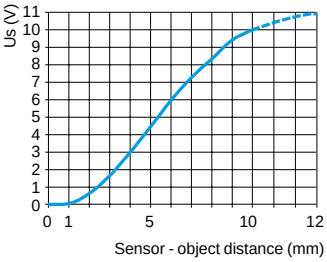
### XS9 F

Sn = 1…5 mm



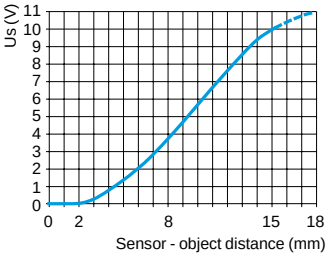

### XS9 E

Sn = 1…10 mm



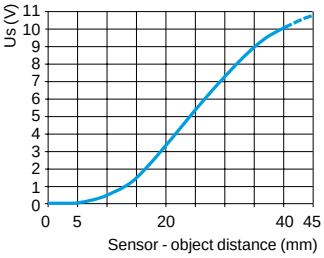

### XS9 C

Sn = 2…15 mm




### XS9 D

Sn = 5…40 mm

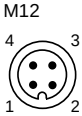



## Wiring schemes

### Connector

M8


M12

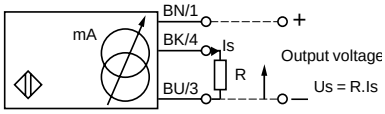



*See connection on page 9/45.*

### Pre-cabled

BN: Brown
BU: Blue
BK: Black

### 3-wire connection




| | Output current | Load impedance value | Output voltage | Load impedance value |
|---|---|---|---|---|
| **24 V** | 0…10 mA | R ⩽ 1400 Ω | 0…10 V | R = 1000 Ω |

***Note:** ensure a minimum of 5 V between the + (terminal 1) and the sensor output (terminal 4).*

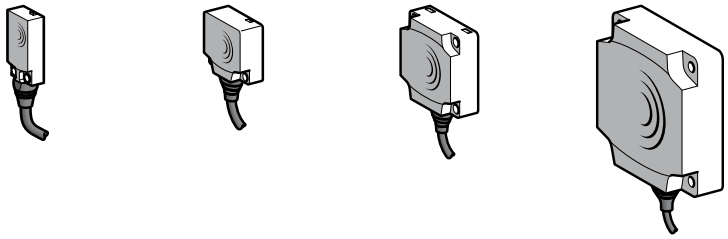
*(1) Voltage range only obtained with a load impedance of 1000 Ω.*

# Inductive proximity sensors
## Osiprox® Application
### Sensors with analogue output signal 0…10 V *(1)*



**Flush mountable in metal**

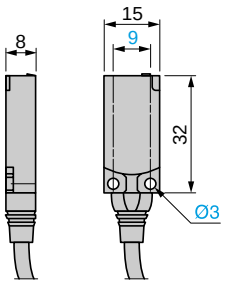
**PBT case**



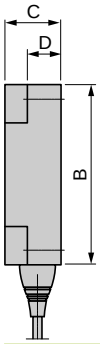
| **Nominal sensing distance (Sn)** | | **5 mm** | **10 mm** | **15 mm** | **40 mm** |
|---|---|---|---|---|---|
| **References** | | | | | |
| **3-wire** ⎓ 0…10 V | Pre-cabled (L = 2 m) *(2)* | **XS9 F111A1L2** | **XS9 E111A1L2** | **XS9 C111A1L2** | **XS9 D111A1L2** |
| | Connector | **XS9 F111A1L01M8** | **XS9 E111A1L01M12** | **XS9 C111A1L01M12** | **XS9 D111A1M12** |
| **Weight (kg)** | Pre-cabled (L = 2 m) *(2)* | 0.060 | 0.075 | 0.095 | 0.340 |
| | Connector | 0.040 | 0.055 | 0.075 | 0.320 |
| **Characteristics** | | | | | |
| **Product certifications** | | UL, CSA, CE | | | |
| **Connection** | Pre-cabled | PvR, 3 x 0.34 mm², length 2 m for **XS9 ●111A●L2** | | | |
| | Connector | 0.15 m flying lead with M8 connector | 0.15 m flying lead with M12 connector | | M12 |
| **Operating zone** | | **1…5 mm** | **1…10 mm** | **2…15 mm** | **5…40 mm** |
| **Degree of protection** Conforming to IEC 60529 | Pre-cabled | IP 68 | IP 68, double insulation ⧈ | | |
| | Connector | IP 67 | IP 67, double insulation ⧈ | | |
| **Storage temperature** | | - 40…+ 85 °C | | | |
| **Operating temperature** | | - 25…+ 70 °C | | | |
| **Materials** | | PBT case | | | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | 50 gn, duration 11 ms | | | |
| **Output state indication** | | No | | | |
| **Rated supply voltage** | | ⎓ 24 V | | | |
| **Voltage limits (including ripple)** | | ⎓ 15…36 V | | | |
| **Repeat accuracy** | | ± 3% | | | |
| **Linearity error** | | ± 1 V | | | |
| **Current consumption, no-load** | | ≤ 4 mA with overload and short-circuit protection | | | |
| **Maximum operating frequency** | | 2000 Hz | 1000 Hz | | 100 Hz |
| **Output current drift** | | ≤ 10% (throughout the operating temperature range) | | | |

## Dimensions

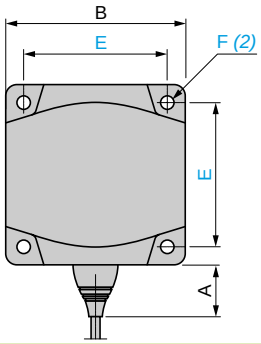
**XS9 F**



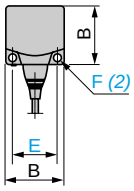

**XS9 E/C/D**




**XS9 C/D**



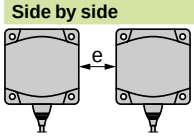
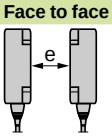
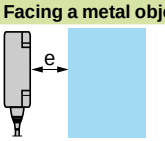

**XS9 E**




*(2) For CHC type screws*

| **Type** | **A (L2)** | **A (M12)** | **B** | **C** | **D** | **E** | **F** |
|---|---|---|---|---|---|---|---|
| **XS9 E** | 14 | – | 26 | 13 | 8.8 | 20 | 3.5 |
| **XS9 C** | 14 | – | 40 | 15 | 9.8 | 33 | 4.5 |
| **XS9 D** | 23 | 14 | 80 | 26 | 16 | 65 | 5.5 |

## Setting-up (Minimum mounting distances (mm))

| **Type** | **Side by side** | | **Face to face** | | **Facing a metal object** | |
|---|---|---|---|---|---|---|
| **XS9 F** |  | e ≥ 15 |  | e ≥ 36 |  | e ≥ 15 |
| **XS9 E** | | e ≥ 30 | | e ≥ 72 | | e ≥ 30 |
| **XS9 C** | | e ≥ 45 | | e ≥ 110 | | e ≥ 45 |
| **XS9 D** | | e ≥ 120 | | e ≥ 300 | | e ≥ 120 |



*(1) Voltage range only obtained with a load impedance of 1000 Ω.*
*(2) For a 5 m long cable replace L2 by L5, for a 10 m long cable replace L2 by L10.*
*Example: XS9 C111A1L2 becomes **XS9 C111A1L5** with a 5 m long cable.*

Accessories:
page 2/106

# Inductive proximity sensors
## Osiprox® Application
## Sensors with analogue output signal 4…20 mA



## Functions

These analogue output proximity sensors are solid-state sensors designed for monitoring displacement. They are not measuring sensors.

**They are suitable for use in numerous sectors, particularly for applications involving:**

- deformation and displacement monitoring,
- vibration amplitude and frequency monitoring,
- control of dimensional tolerances,
- position control,
- concentricity or eccentricity monitoring.

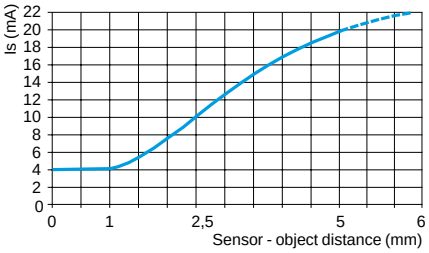
## Operating principle

The operating principle of the sensor is that of a damped oscillator. The degree of damping will depend on the distance of an object from the sensing face. The sensor will sense the distance and produce an output current with a value directly proportional to this distance.

## Output curves 4…20 mA, 2-wire connection

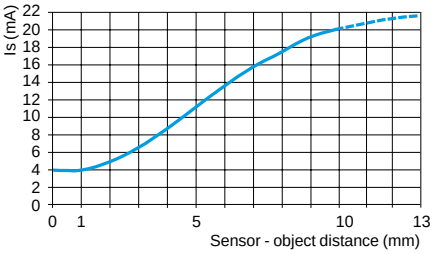
### XS9 F

**Sn = 1…5 mm**



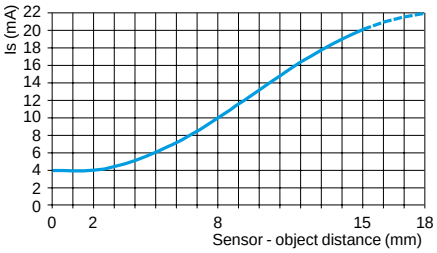

### XS9 E

**Sn = 1…10 mm**



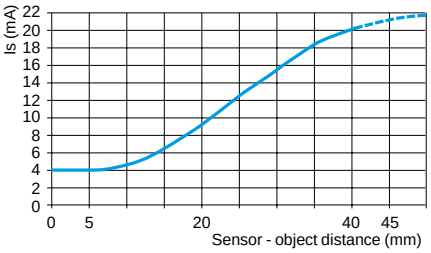

### XS9 C

**Sn = 2…15 mm**




### XS9 D

**Sn = 5…40 mm**




## Wiring schemes

### Connector

M8

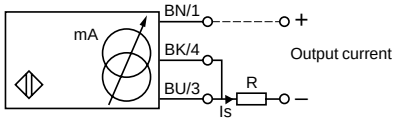

M12


*See connection on page 9/45.*

### Pre-cabled

BN: Brown
BU: Blue
BK: Black

### 2-wire connection




| | Output current | Load impedance value |
|---|---|---|
| **12 V** | 4…20 mA | R ⩽ 8.2 Ω |
| **24 V** | 4…20 mA | R ⩽ 470 Ω |

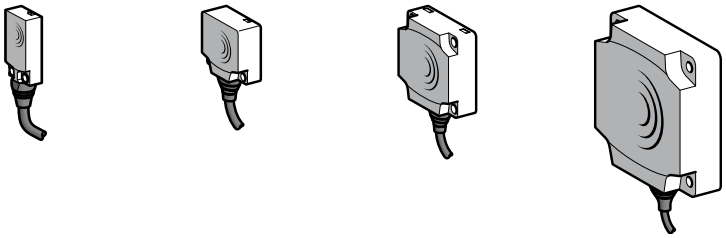
***Note:*** *ensure a minimum of 10 V between the + (terminal 1) and - (terminal 3) of the sensor.*

# Inductive proximity sensors
## Osiprox® Application
Sensors with analogue output signal 4…20 mA



**Flush mountable in metal**

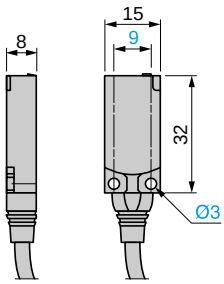
**PBT case**



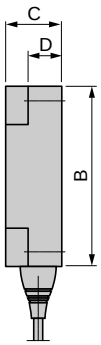
| | | | | | |
|---|---|---|---|---|---|
| **Nominal sensing distance (Sn)** | | **5 mm** | **10 mm** | **15 mm** | **40 mm** |
| **References** | | | | | |
| **2-wire** ⎓ 4…20 mA | Pre-cabled (L = 2 m) *(1)* | **XS9 F111A2L2** | **XS9 E111A2L2** | **XS9 C111A2L2** | **XS9 D111A2L2** |
| | Connector | **XS9 F111A2L01M8** | **XS9 E111A2L01M12** | **XS9 C111A2L01M12** | **XS9 D111A2M12** |
| **Weight (kg)** | Pre-cabled (L = 2 m) | 0.060 | 0.075 | 0.095 | 0.340 |
| | Connector | 0.040 | 0.055 | 0.075 | 0.320 |
| **Characteristics** | | | | | |
| **Product certifications** | | UL, CSA, CE | | | |
| **Connection** | Pre-cabled | PvR, 3 x 0.34 mm², length 2 m for **XS9 ●111A●L2** | | | |
| | Connector | 0.15 m flying lead with M8 connector | 0.15 m flying lead with M12 connector | | M12 |
| **Operating zone** | | **1…5 mm** | **1…10 mm** | **2…15 mm** | **5…40 mm** |
| **Degree of protection** conforming to IEC 60529 | Pre-cabled | IP 68 | IP 68, double insulation ⧈ | | |
| | Connector | IP 67 | IP 67, double insulation ⧈ | | |
| **Storage temperature** | | - 40…+ 85 °C | | | |
| **Operating temperature** | | - 25…+ 70 °C | | | |
| **Materials** | | PBT case | | | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | 50 gn, duration 11 ms | | | |
| **Output state indication** | | No | | | |
| **Rated supply voltage** | | ⎓ 12…24 V | | | |
| **Voltage limits (including ripple)** | | ⎓ 10…36 V | | | |
| **Repeat accuracy** | | ± 3% | | | |
| **Linearity error** | | ± 2 mA | | | |
| **Current consumption, no-load** | | ⩽ 4 mA with overload and short-circuit protection | | | |
| **Maximum operating frequency** | | 2000 Hz | 1000 Hz | | 100 Hz |
| **Output current drift** | | ⩽ 10% (throughout the operating temperature range) | | | |

## Dimensions

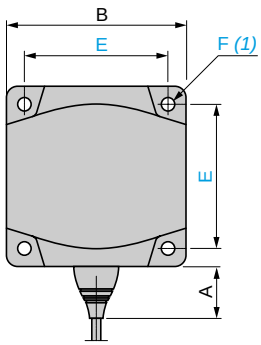
**XS9 F**



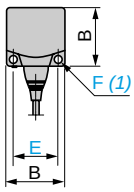

**XS9 E/C/D**




**XS9 C/D**



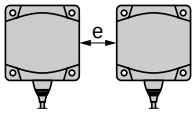
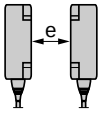
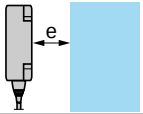

**XS9 E**




*(1) For CHC type screws*

| Type | A (L2) | A (M12) | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| **XS9 E** | 14 | – | 26 | 13 | 8.8 | 20 | 3.5 |
| **XS9 C** | 14 | – | 40 | 15 | 9.8 | 33 | 4.5 |
| **XS9 D** | 23 | 14 | 80 | 26 | 16 | 65 | 5.5 |

## Setting-up (Minimum mounting distances (mm))

| Type | Side by side | | Face to face | | Facing a metal object | |
|---|---|---|---|---|---|---|
| **XS9 F** | e ≥ 15 |  | e ≥ 36 |  | e ≥ 15 |  |
| **XS9 E** | e ≥ 30 | | e ≥ 72 | | e ≥ 30 | |
| **XS9 C** | e ≥ 45 | | e ≥ 110 | | e ≥ 45 | |
| **XS9 D** | e ≥ 120 | | e ≥ 300 | | e ≥ 120 | |



*(1) For a 5 m long cable replace L2 by L5, for a 10 m long cable replace L2 by L10.*
*Example: XS9 F111A2L2 becomes **XS9 F111A2L5** with a 5 m long cable.*

Accessories:
page 2/106

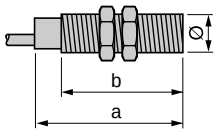
# Inductive proximity sensors

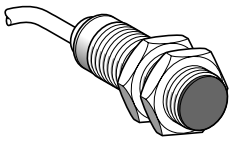
## Osiprox® Application

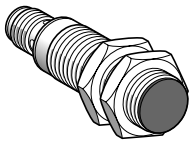
Detection at fixed sensing distance. Factor 1 (Fe/Nfe) sensors *(1)*. For ferrous and non ferrous materials
Solid-state output



### Sensors flush mountable in metal

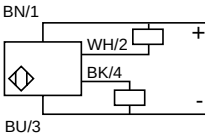
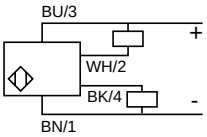




| | | | |
|---|---|---|---|
| Lengths (mm):<br>a = Overall<br>b = Threaded section | | a = 60<br>b = 51.5<br>Ø = M18 x 1 | a = 70<br>b = 51.5<br>Ø = M18 x 1 |
| | | **Brass case** | **Brass case** |
| **Nominal sensing distance** (Sn) | | **5 mm** | **5 mm** |
| **References** | | | |
| **4-wire** ⎓ | PNP/PNP programmable NO/NC | **XS1 M18KPM40** | **XS1 M18KPM40D** |
| **Weight** (kg) | | 0.120 | 0.060 |
| **Characteristics** | | | |
| **Product certifications** | | CE, UL, CSA | |
| **Connection** | | **Pre-cabled, PvR 4 x 0.34 mm², length 2 m** *(2)* | **M12 connector** |
| **Degree of protection** | Conforming to IEC 60529 | IP 68 | IP 67 |
| **Operating zone** | | **0…4 mm** | |
| **Repeat accuracy** | | 3% of Sr | |
| **Differential travel** | | 1…15% of Sr | |
| **Operating temperature** | | 0…+ 50 °C | |
| **Output state indication** | | Yellow LED, annular | Yellow LED, 4 viewing ports at 90° |
| **Rated supply voltage** | | ⎓ **12…24 V with protection against reverse polarity** | |
| **Voltage limits** (including ripple) | | ⎓ 10…38 V | |
| **Switching capacity** | | **0...200 mA with overload and short-circuit protection** | |
| **Voltage drop, closed state** | | ≤ 2.6 V | |
| **Current consumption, no-load** | | ≤ 15 mA | |
| **Maximum switching frequency** | | 1000 Hz | |
| **Delays** | First-up | ≤ 10 ms | |
| | Response | ≤ 0.3 ms | |
| | Recovery | ≤ 0.7 ms | |

### Wiring schemes

| **M12 connector** | **Pre-cabled** | **4-wire ⎓, PNP/NPN programmable, NO or NC output** | |
|---|---|---|---|
| | | **NO** | **NC** |
|  | BN: brown<br>BU: blue<br>BK: black<br>WH: white |  |  |

*See connection on page 9/45.*

*(1) The variation in sensing distance between ferrous and non ferrous materials is typically less than 5%.*
*(2) Sensors available with other cable lengths: please consult your Regional Sales office.*

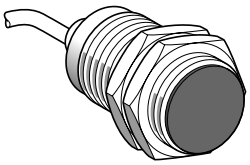
Accessories:
page 2/106

# Inductive proximity sensors

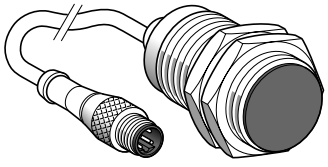
## Osiprox® Application

Detection at fixed sensing distance. Factor 1 (Fe/Nfe) sensors *(1)*. For ferrous and non ferrous materials
Solid-state output





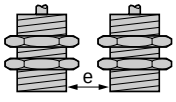
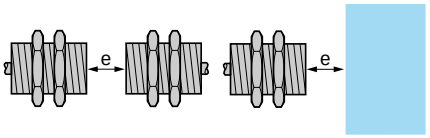
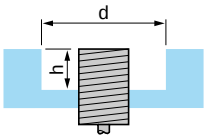
a = 60
b = 51.5
Ø = M30 x 1.5



a = 70
b = 51.5
Ø = M12 x 1

| **Stainless steel case** | **Stainless steel case** |
|---|---|
| **10 mm** | **10 mm** |
| **XS1 M30KPM40** | **XS1 M30KPM40LD** |
| 0.205 | 0.145 |
| ∈, UL, CSA | |
| **Pre-cabled, PvR 4 x 0.34 mm², length 2 m** *(2)* | **M12 connector on 0.8 m flying lead** |
| IP 68 | IP 67 |
| **0…8 mm** | |
| 3% of Sr | |
| 1…15% of Sr | |
| 0…+ 50 °C | |
| Yellow LED, annular | |
| ⎓ **12…24 V with protection against reverse polarity** | |
| ⎓ 10…38 V | |
| **0…200 mA with overload and short-circuit protection** | |
| ⩽ 2.6 V | |
| ⩽ 15 mA | |
| 1000 Hz | |
| ⩽ 5 ms | |
| ⩽ 0.3 ms | |
| ⩽ 0.7 ms | |

## Setting-up

| **Minimum mounting distances (mm)** | **Side by side** | **Face to face** | **Facing a metal object** | **Mounted in a metal support** |
|---|---|---|---|---|
| |  |  | |  |
| **XS1 M18 flush mountable** | e ⩾ 10 | e ⩾ 60 | e ⩾ 15 | d ⩾ 18, h ⩾ 0 |
| **XS1 M30 flush mountable** | e ⩾ 20 | e ⩾ 120 | e ⩾ 30 | d ⩾ 30, h ⩾ 0 |

***Fixing nut tightening torque: XS1 M18**: < 35 N.m, **XS1 M30**: < 100 N.m*

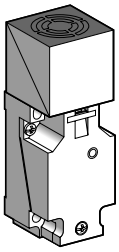
*(1) The variation in sensing distance between ferrous and non ferrous materials is typically less than 5%.*
*(2) Sensors available with other cable lengths: please consult your Regional Sales office.*

# Inductive proximity sensors

## Osiprox® Application

Fixed sensing distance detection, Factor 1 (Fe/Nfe) sensors *(1)*. For ferrous and non ferrous materials
Solid-state output



| **Sensor** | | **Flush mountable in metal** |
|---|---|---|
| | |  |
| **Nominal sensing distance (Sn)** | | 15 mm |
| **References** | | |
| **4-wire ⎓** | PNP/NPN/NO/NC programmable | **XS7 C40KPM40** |
| **Weight (kg)** | | 0.220 |
| **Characteristics** | | |
| **Product certifications** | | CE, CSA, UL |
| **Degree of protection** | Conforming to IEC 60529 | IP 67 |
| **Operating temperature** | | 0…+ 50 °C |
| **Connection** | | Screw terminals, clamping capacity: 4 x 0.34 $mm^2$ *(2)* |
| **Operating zone** | | **0…12 mm** |
| **Repeat accuracy** | | 3% of Sr |
| **Differential travel** | | 1…15% of Sr |
| **Output state indication** | | Yellow LED |
| **Rated supply voltage** | | ⎓ 12…24 V with protection against reverse polarity |
| **Voltage limits (including ripple)** | | ⎓ 10…38 V |
| **Current consumption, no-load** | | ≤ 15 mA |
| **Switching capacity** | | 0…200 mA with overload and short-circuit protection |
| **Voltage drop, closed state** | | ≤ 2.6 V |
| **Maximum switching frequency** | | 1000 Hz |
| **Delays** | First-up | ≤ 5 ms |
| | Response | ≤ 0.3 ms |
| | Recovery | ≤ 0.7 ms |

*(1) The variation in sensing distance between ferrous and non ferrous materials is typically less than 5%.*
*(2) Cable gland not included with sensor. For suitable 13P cable gland (XSZ PE13), see page 2/106.*

# Inductive proximity sensors

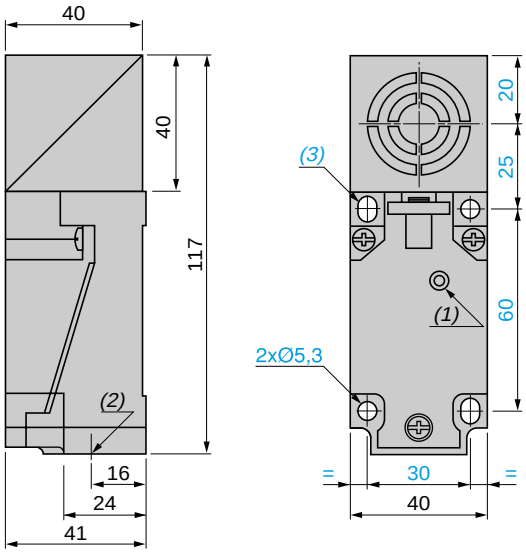
## Osiprox® Application

Fixed sensing distance detection, Factor 1 (Fe/Nfe) sensors *(1)*. For ferrous and non ferrous materials
Solid-state output



## Dimensions

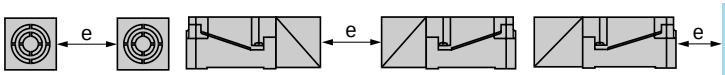
**XS7 C40KPM40**




*(1) Output LED.*
*(2) 1 tapped entry for 13P cable gland.*
*(3) 2 elongated holes Ø 5.3 x 7.*

## Setting-up

**Minimum mounting distances (mm)**




| | | Side by side | Face to face | Facing a metal object |
|---|---|---|---|---|
| **Sensor flush mountable in metal** | **XS7 C40KPM40** | e ≥ 40 | e ≥ 120 | e ≥ 45 |

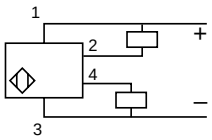
**Tightening torque of cover fixing screws and clamp screws:** < 1.2 N.m

## Wiring schemes

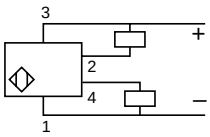
**PNP/NPN**

**4-wire ⎓ programmable, NO or NC output**

**NO output**




**NC output**



# Inductive proximity sensors

Osiprox® Application

Selective detection of ferrous materials

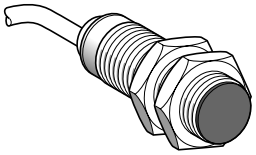
Selective detection of non ferrous materials

Cylindrical type, solid-state output



**Flush mountable**

**Stainless steel case**



| | | | |
|---|---|---|---|
| **Nominal sensing distance (Sn)** | | | 5 mm |

## References

| | | | |
|---|---|---|---|
| **3-wire, ferrous version**<br>Insensitive to non ferrous materials | PNP | NO | **XS1 M18PAS40** |
| **3-wire, non ferrous version**<br>Insensitive to ferrous materials | PNP | NO | **XS1 M18PAS20** |
| **Weight (kg)** | | | 0.120 |

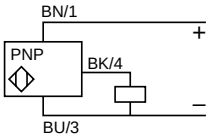
## Characteristics

| | | |
|---|---|---|
| **Product certifications** | | UL, CSA, CE |
| **Connection** | | **Pre-cabled (PvR)** 3 x 0.34 mm², length 2 m *(1)* |
| **Operating zone** | | **0…4 mm** |
| **Degree of protection** conforming to IEC 60529 | | IP 68 |
| **Operating temperature range** | | - 25…+ 70 °C |
| **Output state indication** | | Yellow LED, annular |
| **Rated supply voltage** | | ⎓ 12…24 V with protection against reverse polarity |
| **Voltage limits (including ripple)** | | ⎓ 10…38 V |
| **Switching capacity** | | 0…200 mA with overload and short-circuit protection |
| **Voltage drop, closed state** | | ≤ 2.6 V |
| **Residual current, open state** | | – |
| **Current consumption, no-load** | | ≤ 15 mA |
| **Maximum switching frequency** | | 1000 Hz |
| **Delays** | First-up | ≤ 10 ms |
| | Response | ≤ 0.3 ms |
| | Recovery | ≤ 0.7 ms |

*(1) Sensors available pre-cabled with other cable lengths: please consult your Regional Sales Office*

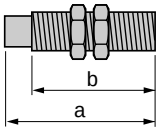
## Wiring scheme

**3-wire ⎓ PNP**




## Dimensions

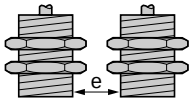
**XS1 M**



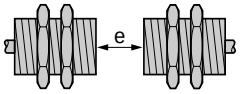

| a (mm) | b (mm) |
|---|---|
| 60 | 51.5 |

## Setting-up

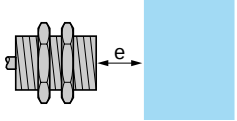
**Minimum mounting distances (mm)**



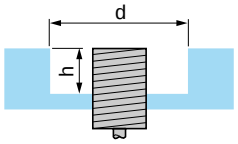

**Side by side**




**Face to face**




**Facing a metal object**




**Mounted in a metal support**

| | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| **XS1 M18** | e ≥ 10 | e ≥ 60 | e ≥ 15 | d ≥ 18, h ≥ 0 (ferrous metal)<br>d ≥ 18, h ≥ 5 (non ferrous metal) |

Accessories:
pages 2/106

# Inductive proximity sensors

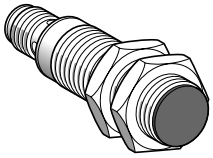
## Osiprox® Application

Selective detection of ferrous materials
Selective detection of non ferrous materials
Cylindrical type, solid-state output



**Flush mountable**

**Stainless steel case**



| | |
|---|---|
| **Nominal sensing distance (Sn)** | 5 mm |

## References

| | | | |
|---|---|---|---|
| **3-wire, ferrous version**<br>Insensitive to non ferrous materials | PNP | NO | **XS1 M18PAS40D** |
| **3-wire, non ferrous version**<br>Insensitive to ferrous materials | PNP | NO | **XS1 M18PAS20D** |
| **Weight (kg)** | | | 0.060 |

## Characteristics

| | | |
|---|---|---|
| **Product certifications** | | UL, CSA, CE |
| **Connection** | | **M12 connector** |
| **Degree of protection** conforming to IEC 60529 | | IP 67 |
| **Operating zone** | | **0…4 mm** |
| **Operating temperature range** | | - 25…+ 70 °C |
| **Output state indication** | | Yellow LED, 4 viewing ports at 90° |
| **Rated supply voltage** | | ⎓ 12…24 V with protection against reverse polarity |
| **Voltage limits (including ripple)** | | ⎓ 10…38 V |
| **Switching capacity** | | 0…200 mA with overload and short-circuit protection |
| **Voltage drop, closed state** | | ≤ 2.6 V |
| **Residual current, open state** | | – |
| **Current consumption, no-load** | | ≤ 15 mA |
| **Maximum switching frequency** | | 1000 Hz |
| **Delays** | First-up | ≤ 10 ms |
| | Response | ≤ 0.3 ms |
| | Recovery | ≤ 0.7 ms |

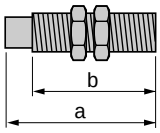
## Wiring scheme

**M12 connector** — **3-wire ⎓ PNP**


*See connection on page 9/45.*

## Dimensions

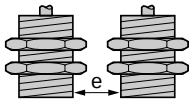
**XS1 M**

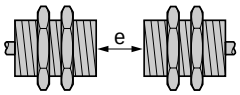


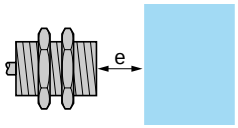

| a (mm) | b (mm) |
|---|---|
| 70 | 51.5 |

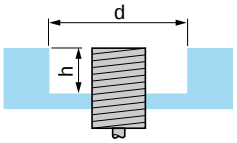
## Setting-up

**Minimum mounting distances (mm)**




| | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| **XS1 M18** | e ≥ 10 | e ≥ 60 | e ≥ 15 | d ≥ 18, h ≥ 0 (ferrous metal)<br>d ≥ 18, h ≥ 5 (non ferrous metal) |

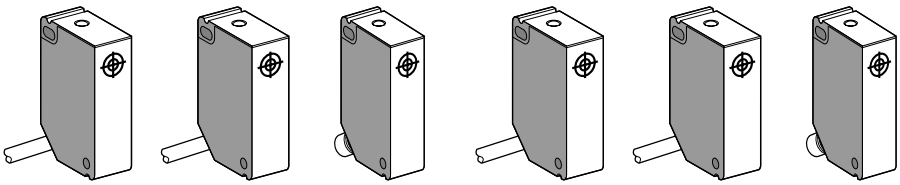
Accessories:
pages 2/106

# Inductive proximity sensors

## Osiprox® Application

For assembly, packaging and light handling
Plastic case: 12 x 26 x 40 mm
dc supply, solid-state output



| Sensor | | | Flush mountable in metal | | | Non flush mountable in metal | | |
|---|---|---|---|---|---|---|---|---|
| | | |  | | | | | |
| **Nominal sensing distance (Sn)** | | | 2 mm | | | 4 mm | | |
| **References** | | | | | | | | |
| **3-wire ⎓** | PNP | NO | **XS7 G12PA140** | – | **XS7 G12PA140S** | **XS8 G12PA140** | – | **XS8 G12PA140S** |
| | NPN | NO | **XS7 G12NA140** | – | **XS7 G12NA140S** | **XS8 G12NA140** | – | **XS8 G12NA140S** |
| **4-wire ⎓** (complementary outputs) | PNP | NO + NC | – | **XS7 G12PC440** | – | – | **XS8 G12PC440** | – |
| | NPN | NO + NC | – | **XS7 G12NC440** | – | – | **XS8 G12NC440** | – |
| **Weight (kg)** | | | 0.100 | 0.100 | 0.030 | 0.100 | 0.100 | 0.030 |
| **Characteristics** | | | | | | | | |
| **Product certifications** | | | CSA, UL, CE | | | | | |
| **Connection** | Pre-cabled | | 3 x 0.34 mm², length 2 m *(1)* | 4 x 0.34 mm², length 2 m *(1)* | – | 3 x 0.34 mm², length 2 m *(1)* | 4 x 0.34 mm², length 2 m *(1)* | – |
| | Connector | | – | – | M8 | – | – | M8 |
| **Operating zone** | | | **0…1.6 mm** | | | **0…3.2 mm** | | |
| **Repeat accuracy** | | | ≤ 10 % of Sr | | | | | |
| **Differential travel** | | | 3...20 % of Sr | | | | | |
| **Degree of protection** | | | IP 67 | | | | | |
| **Storage temperature range** | | | -40…+85 °C | | | | | |
| **Operating temperature range** | | | -25…+70 °C | | | | | |
| **Materials** | | | Case: PBT, cable: PVC | | | | | |
| **Vibration resistance** Conforming to IEC 60068-2-6 | | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | | | | | |
| **Shock resistance** Conforming to IEC 60068-2-27 | | | 50 gn, duration 11 ms | | | | | |
| **Output state indication** | | | Yellow LED, on top of case | | | | | |
| **Rated supply voltage** | | | ⎓ 12…24 V | ⎓ 12…48 V | ⎓ 12…24 V | ⎓ 12…24 V | ⎓ 12…48 V | ⎓ 12…24 V |
| **Voltage limits (including ripple)** | | | ⎓ 10…30 V | ⎓ 10…58 V | ⎓ 10…30 V | ⎓ 10…30 V | ⎓ 10…58 V | ⎓ 10…30 V |
| **Current consumption, no-load** | | | ≤ 10 mA | | | | | |
| **Switching capacity** | | | 0…100 mA *(2)* | 0…200 mA *(2)* | 0…100 mA (2) | 0…100 mA *(2)* | 0…200 mA *(2)* | 0…100 mA *(2)* |
| **Voltage drop, closed state** | | | ≤ 1.8 V | ≤ 2.6 V | ≤ 1.8 V | ≤ 1.8 V | ≤ 2.6 V | ≤ 1.8 mA |
| **Maximum switching frequency** | | | ≤ 2 kHz | | | ≤ 1 kHz | | |
| **Delays** | First-up | | ≤ 4 ms | | | | | |
| | Response | | ≤ 0.5 ms | | | | | |
| | Recovery | | ≤ 1 ms | | | | | |

*(1) Sensors available pre-cabled with other cable lengths:*

| Length of cable | Suffix to be added to references stated above for 2 m pre-cabled sensors | Weight increase |
|---|---|---|
| 5 m | **L1** | 0.120 kg |
| 10 m | **L2** | 0.320 kg |

Example: sensor **XS7 G12PA**140 with 5 m cable becomes **XS7 G12PA140L1.**

*(2) With overload and short-circuit protection*

# Inductive proximity sensors

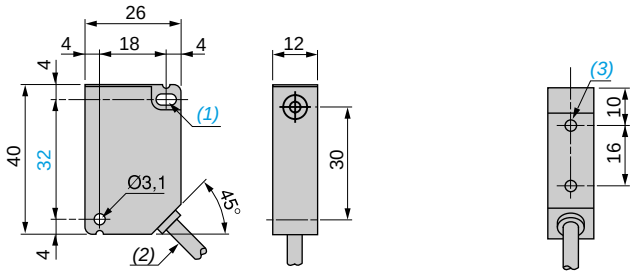
## Osiprox® Application

For assembly, packaging and light handling
Plastic case: 12 x 26 x 40 mm
dc supply, solid-state output



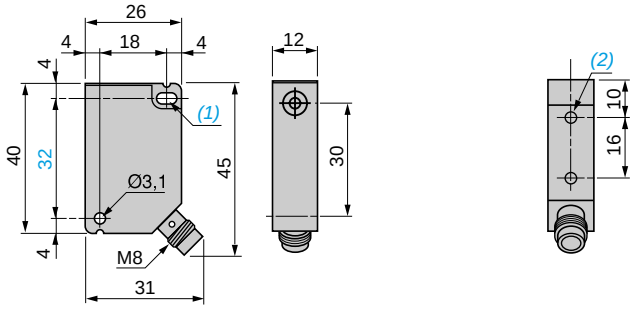
## Dimensions

### XS● G12●A140, XS● G12●C440




*(1) 1 elongated hole 3.1 x 5.1.*
*(2) Pre-cabled L = 2 m.*
*(3) 2 holes M3 x 5.*

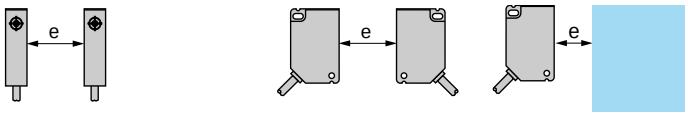
### XS● G12●A140S




*(1) 1 elongated hole 3.1 x 5.1*
*(2) 2 holes M3 x 5*

## Setting-up

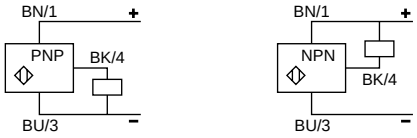
### Minimum mounting distances (mm)



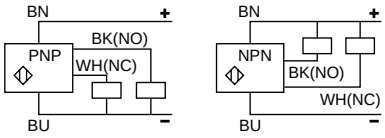

| | Side by side | Face to face | Facing a metal object and mounting in a metal support |
|---|---|---|---|
| **XS7 G flush mountable** | e ≥ 0 | e ≥ 15 | e ≥ 6 |
| **XS8 G non flush mountable** | e ≥ 10 | e ≥ 60 | e ≥ 12 |

## Wiring scheme

### 3-wire ⎓, NO output




### 4-wire ⎓, NO + NC output




### Connector

M8

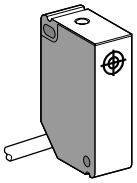
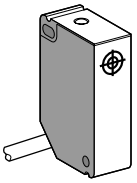

*See connection on page 9/45.*

# Inductive proximity sensors

## Osiprox® Application

For assembly, packaging and light handling
Plastic case: 12 x 26 x 40 mm
a.c. or d.c. supply



| Sensor | | Flush mountable in metal | Non flush mountable in metal |
|---|---|---|---|
| | |  |  |
| **Nominal sensing distance (Sn)** | | 2 mm | 4 mm |
| **References** | | | |
| **2-wire ⎓ or ∿** | NO | **XS7 G12MA230** | **XS8 G12MA230** |
| | NC | **XS7 G12MB230** | **XS8 G12MB230** |
| **Weight (kg)** | | 0.100 | 0.100 |
| **Characteristics** | | | |
| **Product certifications** | | CSA, UL, CE | |
| **Connection** | | Pre-cabled 2 x 0.34 mm², length 2 m *(1)* | |
| **Operating zone** | | **0…1.6 mm** | **0…3.2 mm** |
| **Repeat accuracy** | | ≤ 10 % of Sr | |
| **Differential travel** | | 3...20 % of Sr | |
| **Degree of protection** | | IP 67 | |
| **Storage temperature range** | | - 40…+ 85 °C | |
| **Operating temperature range** | | - 25…+ 70 °C | |
| **Materials** | | Case: PBT, cable: PVC | |
| **Vibration resistance** Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | |
| **Shock resistance** Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Output state indication** | | Yellow LED, on top of case | |
| **Rated supply voltage** | | ∿ 24…240 V (50/60 Hz) or ⎓ 24…210 V | |
| **Voltage limits (including ripple)** | | ∿ or ⎓ 20…264 V | |
| **Switching capacity** | | 5…200 mA (2) | |
| **Voltage drop, closed state** | | ⩽ 5.5 V | |
| **Residual current, open state** | | ⩽ 0.8 mA / 24 V, 1.5 mA / 120 V | |
| **Maximum switching frequency** | | ∿ 25 Hz or ⎓ 250 Hz | |
| **Delays** | First-up | ⩽ 40 ms | |
| | Response | ⩽ 1 ms | |
| | Recovery | ⩽ 2 ms | |

*(1) Sensors available pre-cabled with other cable lengths:*

| Length of cable | Suffix to be added to references stated above for 2 m pre-cabled sensors | Weight increase |
|---|---|---|
| 5 m | **L1** | 0.120 kg |
| 10 m | **L2** | 0.320 kg |

Example: sensor **XS7 G12MA230** with 5 m cable becomes **XS7 G12MA230L1.**

*(2) As these sensors do not incorporate overload or short-circuit protection, it is essential to connect a 0.4 A quick-blow fuse in series with the load.*

# Inductive proximity sensors

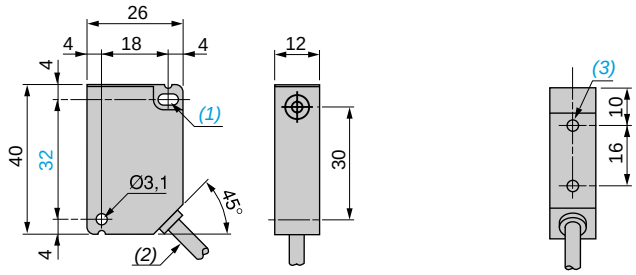
## Osiprox® Application

For assembly, packaging and light handling
Plastic case: 12 x 26 x 40 mm
a.c. or d.c. supply



## Dimensions

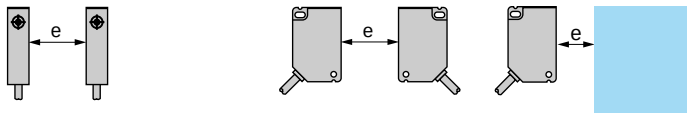
**XS● G12M●230**




*(1) 1 elongated hole 3.1 x 5.1.*
*(2) Pre-cabled L = 2 m.*
*(3) 2 holes M3 x 5.*

## Setting-up

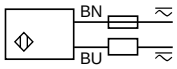
**Minimum mounting distances (mm)**




| | Side by side | Face to face | Facing a metal object and mounting in a metal support |
|---|---|---|---|
| **XS7 G flush mountable** | e ≥ 0 | e ≥ 15 | e ≥ 6 |
| **XS8 G non flush mountable** | e ≥ 10 | e ≥ 60 | e ≥ 12 |

## Wiring scheme

**2-wire ∼ or ⎓ , NO or NC output**

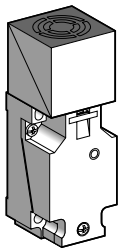
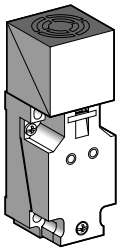


# Inductive proximity sensors

## Osiprox® Application

Plastic case, form C, plug-in
5 position turret head
d.c. supply



| Sensor | | | Flush mountable in metal | | | Non flush mountable in metal | | |
|---|---|---|---|---|---|---|---|---|
| | | |  | | |  | | |
| **Nominal sensing distance (Sn)** | | | 15 mm | Increased range model 20 mm | 15 mm | 20 mm | Increased range model 40 mm | 20 mm |
| **References** | | | | | | | | |
| **4-wire ⎓** (complementary outputs) | PNP | NO + NC | **XS7 C40PC440** | **XS7 C40PC449** | – | **XS8 C40PC440** | **XS8 C40PC449** | – |
| | NPN | NO + NC | **XS7 C40NC440** | **XS7 C40NC449** | – | **XS8 C40NC440** | **XS8 C40NC449** | – |
| **2-wire ⎓** (non polarised) | NO | | – | – | **XS7 C40DA210** | – | – | **XS8 C40DA210** |
| | NO or NC programmable | | – | – | **XS7 C40DP210** | – | – | **XS8 C40DP210** |
| **Weight (kg)** | | | 0.220 | 0.220 | 0.220 | 0.220 | 0.220 | 0.220 |
| **Characteristics** | | | | | | | | |
| **Product certifications** | | | UL, CSA, CE | | | | | |
| **Degree of protection** conforming to IEC 60529 | | | IP 67 | | | | | |
| **Operating temperature** | | | - 25…+ 70 °C | | | | | |
| **Connection** | | | Screw terminals, clamping capacity: 2 or 4 x 1.5 mm² *(1)* | | | | | |
| **Operating zone** | | | **0…12 mm** | **0…16 mm** | **0…12 mm** | **0…16 mm** | **0…32 mm** | **0…16 mm** |
| **Repeat accuracy** | | | ≤ 3% of real sensing distance (Sr) | | | | | |
| **Differential travel** | | | 3…20% of real sensing distance (Sr) | | | | | |
| **Status indication** | Output | | Yellow LED | | Yellow LED | Yellow LED | | Yellow LED |
| | Supply on | | Green LED | | – | Green LED | | – |
| **Rated supply voltage** | | | ⎓ 12…48 V with protection against reverse polarity | | | | | |
| **Voltage limits (including ripple)** | | | ⎓ 10…58 V | | | | | |
| **Current consumption, no-load** | | | ≤ 10 mA | | – | ≤ 10 mA | | – |
| **Switching capacity** | | | 0…200 mA | | 1.5…100 mA | 0…200 mA | | 1.5…100 mA |
| | | | With overload and short-circuit protection | | | | | |
| **Residual current, open state** | | | – | | ≤ 0.5 mA | – | | ≤ 0.5 mA |
| **Voltage drop, closed state** | | | ≤ 2 V | | ≤ 4 V | ≤ 2 V | | ≤ 4 V |
| **Maximum switching frequency** | | | 1000 Hz | | 1500 Hz | 1000 Hz | 500 Hz | 800 Hz |
| **Delays** | First-up | | ≤ 5 ms | | ≤ 5 ms | ≤ 5 ms | ≤ 5 ms | ≤ 5 ms |
| | Response | | ≤ 0.3 ms | | ≤ 2 ms | ≤ 0.3 ms | < 1 ms | ≤ 2 ms |
| | Recovery | | ≤ 0.7 ms | | ≤ 5 ms | ≤ 0.7 ms | < 1 ms | ≤ 7 ms |

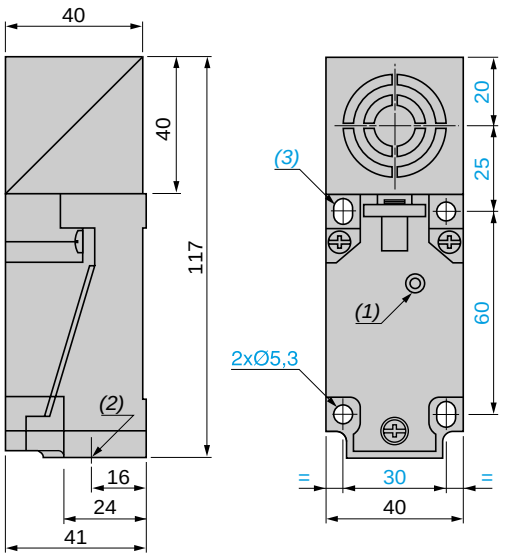
*(1) Cable gland not included with sensor. For suitable 13P cable gland (XSZ PE13), see page 2/106.*

# Inductive proximity sensors
Osiprox® Application
Plastic case, form C, plug-in
5 position turret head
d.c. supply



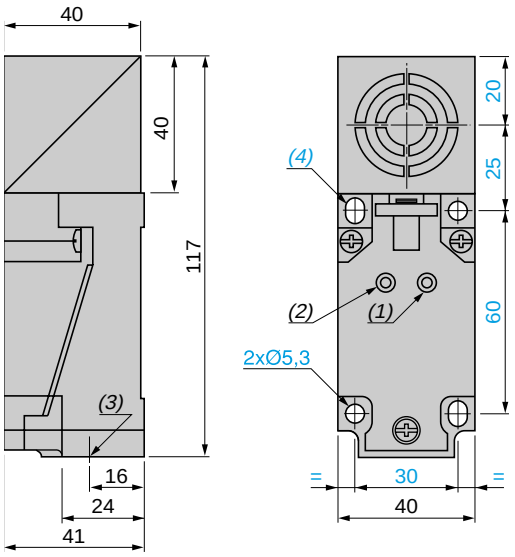
## Dimensions

### XS7 C40D●210, XS8 C40D●210




*(1) Output LED.*
*(2) 1 tapped entry for 13P cable gland.*
*(3) 2 elongated holes Ø 5.3 x 7.*

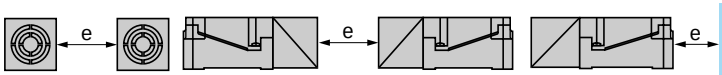
### XS7 C40●C44●, XS8 C40●C44●




*(1) Output LED.*
*(2) Supply LED.*
*(3) 1 tapped entry for 13P cable gland.*
*(4) 2 elongated holes Ø 5.3 x 7.*

## Setting-up

### Minimum mounting distances (mm)

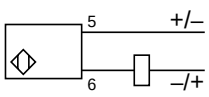


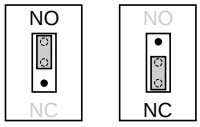

| | | Side by side | Face to face | Facing a metal object |
|---|---|---|---|---|
| **Sensors flush mountable in metal** | **XS7** | e ≥ 40 | e ≥ 120 | e ≥ 45 |
| | **XS7 increased range model** | e ≥ 80 | e ≥ 240 | e ≥ 60 |
| **Sensors non flush mountable in metal** | **XS8** | e ≥ 80 | e ≥ 160 | e ≥ 60 |
| | **XS8 increased range model** | e ≥ 160 | e ≥ 320 | e ≥ 120 |

**Tightening torque of cover fixing screws and clamp screws:** < 1.2 N.m

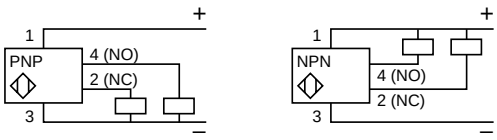
## Wiring schemes

### 2-wire ⎓ (non polarised), NO or NC output depending on position of link



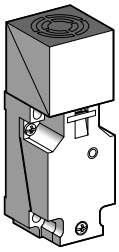
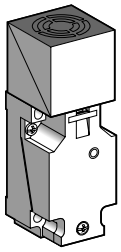




### 4-wire ⎓, NO + NC output



# Inductive proximity sensors
## Osiprox® Application
Plastic case, form C, plug-in
5 position turret head
a.c. or d.c. supply



| Sensor | | Flush mountable in metal | | Non flush mountable in metal | |
|---|---|---|---|---|---|
| | |  | |  | |
| | | AC | AC/DC | AC | AC/DC |
| **Nominal sensing distance (Sn)** | | 15 mm | | 20 mm | |
| **References** | | | | | |
| **2-wire ∿** | NO or NC programmable | **XS7 C40FP260** | – | **XS8 C40FP260** | – |
| **2-wire ∿ or ⎓ universal model** | NO or NC programmable | – | **XS7 C40MP230** | – | **XS8 C40MP230** |
| **Weight (kg)** | | 0.220 | 0.220 | 0.220 | 0.220 |
| **Characteristics** | | | | | |
| **Product certifications** | | UL, CSA, CE | | | |
| **Degree of protection** conforming to IEC 60529 | | IP 67 | | | |
| **Operating temperature** | | - 25…+ 70 °C | | | |
| **Connection** | | Screw terminals, clamping capacity: 2 x 1.5 mm² *(1)* | | | |
| **Operating zone** | | **0…12 mm** | | **0…16 mm** | |
| **Repeat accuracy** | | ≤ 3% of real sensing distance (Sr) | | | |
| **Differential travel** | | 3...20% of real sensing distance (Sr) | | | |
| **Output state indication** | | Yellow LED | | | |
| **Rated supply voltage** with protection against reverse polarity | | ∿ 24…240 V, 50/60 Hz | ∿ 24…240 V, 50/60 Hz or ⎓ 24…210 V | ∿ 24…240 V, 50/60 Hz | ∿ 24…240 V, 50/60 Hz or ⎓ 24…210 V |
| **Voltage limits (including ripple)** | | ∿ 20…264 V | ∿ or ⎓ 20…264 V | ∿ 20…264 V | ∿ or ⎓ 20…264 V |
| **Current consumption, no-load** | | – | | | |
| **Switching capacity** | | 5…500 mA *(2)* (2 A inrush) | ∿ 5…300 mA or ⎓ *5…200 mA (2)* | 5…500 mA *(2)* (2 A inrush) | ∿ 5…300 mA or ⎓ *5…200 mA (2)* |
| **Residual current, open state** | | ⩽ 1.5 mA | 0.8 mA on 24 V 1.5 mA on 120 V | ⩽ 1.5 mA | 0.8 mA on 24 V 1.5 mA on 120 V |
| **Voltage drop, closed state** | | ⩽ 5.5 V | | | |
| **Maximum switching frequency** | | 25 Hz | ∿ 25 Hz, ⎓ 50 Hz | 25 Hz | ∿ 25 Hz, ⎓ 50 Hz |
| **Delays** | First-up | ⩽ 120 ms | | | |
| | Response | ⩽ 30 ms | | | |
| | Recovery | ⩽ 20 ms | | | |

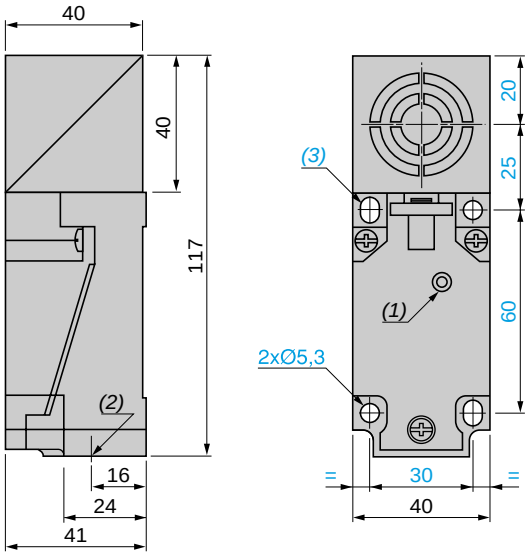
*(1) Cable gland not included with sensor. For suitable 13P cable gland (XSZ PE13), see page 2/106.*

*(2) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a "quick-blow" fuse in series with the load, see page 2/106.*

# Inductive proximity sensors
## Osiprox® Application
Plastic case, form C, plug-in
5 position turret head
a.c. or d.c. supply

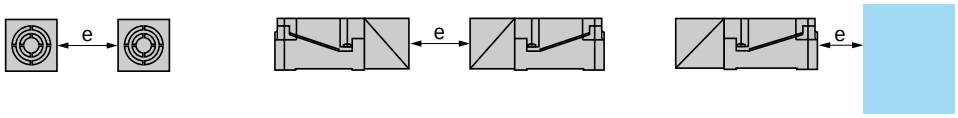


## Dimensions
**XS7 C40FP260, XS7 C40MP230, XS8 C40FP260, XS8 C40MP230**




*(1) Output LED.*
*(2) 1 tapped entry for 13P cable gland.*
*(3) 2 elongated holes Ø 5.3 x 7.*

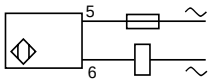
## Setting-up
**Minimum mounting distances (mm)**

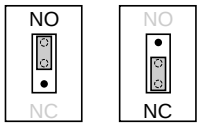



| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| **XS7 flush mountable** | e ≥ 40 | e ≥ 120 | e ≥ 45 |
| **XS8 non flush mountable** | e ≥ 80 | e ≥ 160 | e ≥ 60 |

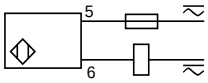
**Tightening torque of cover fixing screws and clamp screws:** < 1.2 N.m

## Wiring schemes
**2-wire ∼ programmable, NO or NC output depending on position of link**




**2-wire ∼ or ⎓ programmable, NO or NC output depending on position of link**

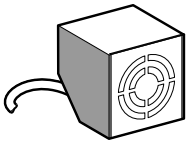
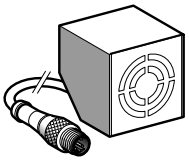
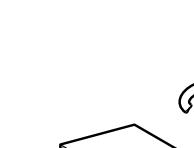
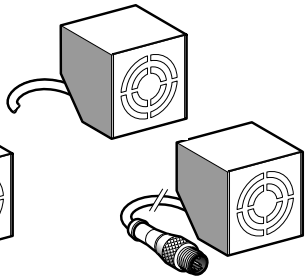


# Inductive proximity sensors

## Osiprox® Application

### Plastic case, form C, cubic 40, multi-position d.c. supply



| Sensor | | Flush mountable in metal | | | | | Non flush mountable in metal | |
|---|---|---|---|---|---|---|---|---|
| | |  | |  | |  |  | |
| **Nominal sensing distance (Sn)** | | 15 mm | | | | | 20 mm | |
| **References** | | | | | | | | |
| **2-wire ⎓** (non polarised) | NO | **XS7 T4DA210** | – | **XS7 T4DA214LD** | – | **XS7 T4DA214LD01** | – | – |
| **4-wire ⎓** (complementary outputs) | PNP NO + NC | – | **XS7 T4PC440** | – | **XS7 T4PC440LD** | – | **XS8 T4PC440** | **XS8 T4PC440LD** |
| | NPN NO + NC | – | **XS7 T4NC440** | – | **XS7 T4NC440LD** | – | **XS8 T4NC440** | **XS8 T4NC440LD** |
| **Weight (kg)** | | 0.265 | 0.265 | 0.220 | 0.220 | 0.200 | 0.265 | 0.220 |
| **Characteristics** | | | | | | | | |
| **Product certifications** | | UL, CSA, CE | | | | | | |
| **Degree of protection** Conforming to IEC 60529 | | IP 67 | | | | | | |
| **Operating temperature** | | - 25…+ 70 °C | | | | | | |
| **Connection** | Pre-cabled | 2 x 0.5 mm² length 2 m *(1)* | 4 x 0.34 mm² length 2 m *(1)* | – | | | 4 x 0.34 mm² length 2 m *(1)* | – |
| | Remote M12 connector | – | | Cable: length 0.8 m | | Cable: length 0.15 m | – | Cable: length 0.8 m |
| **Operating zone** | | **0…12 mm** | | | | | **0…16 mm** | |
| **Repeat accuracy** | | ≤ 3 % of real sensing distance (Sr) | | | | | | |
| **Differential travel** | | 3…20 % of real sensing distance (Sr) | | | | | | |
| **Supply/output state indication** | | Yellow LED, rear mounted | | | | | | |
| **Rated supply voltage** | | ⎓ 12…48 V with protection against reverse polarity | | | | | | |
| **Voltage limits (including ripple)** | | ⎓ 10…58 V | | | | | | |
| **Current consumption, no-load** | | – | ≤ 10 mA | – | ≤ 10 mA | – | ≤ 10 mA | |
| **Switching capacity** | | 1.5…100 mA | 0…200 mA | 1.5…100 mA | 0…200 mA | 1.5…100 mA | 0…200 mA | |
| | | With overload and short-circuit protection | | | | | | |
| **Residual current, open state** | | ≤ 0.7 mA | ≤ 0.1 mA | ≤ 0.7 mA | ≤ 0.1 mA | ≤ 0.7 mA | ≤ 0.1 mA | |
| **Voltage drop, closed state** | | ≤ 5.2 V | ≤ 2 V | ≤ 5.2 V | ≤ 2 V | ≤ 5.2 V | ≤ 2 V | |
| **Maximum switching frequency** | | 150 Hz | 1000 Hz | 150 Hz | 1000 Hz | 150 Hz | 1000 Hz | |
| **Delays** | First-up | ≤ 5 ms | ≤ 7 ms | ≤ 5 ms | ≤ 7 ms | ≤ 5 ms | ≤ 7 ms | |
| | Response | ≤ 2 ms | ≤ 0.3 ms | ≤ 2 ms | ≤ 0.3 ms | ≤ 2 ms | ≤ 0.3 ms | |
| | Recovery | ≤ 5 ms | ≤ 0.7 ms | ≤ 5 ms | ≤ 0.7 ms | ≤ 5 ms | ≤ 0.7 ms | |

*(1) Sensors pre-cabled with other cable lengths :*

| Length of cable | Suffix to be added to references stated above for 2 m pre-cabled sensors | Weight increase |
|---|---|---|
| 5 m | **L1** | 0.120 kg |
| 10 m | **L2** | 0.320 kg |

Example: sensor **XS7 T4DA210** with 5 m cable becomes **XS7 T4DA210L1**

**Other versions** Inductive proximity sensors specifically designed for other operating temperatures. Please consult your Regional Sales Office.

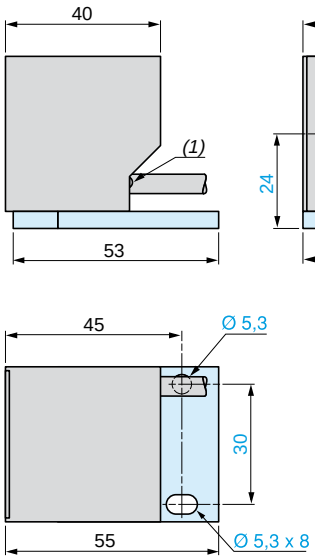
# Inductive proximity sensors
## Osiprox® Application
Plastic case, form C, cubic 40, multi-position
d.c. supply



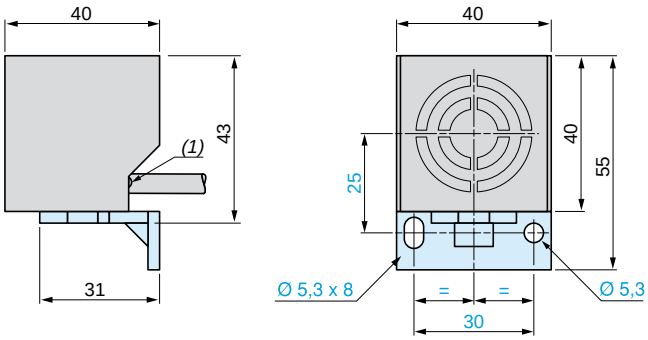
## Dimensions

**XS● T4●●●●●, XS● T4●●●●●LD, XS7 T4●●●●●LD01**

**Plate mounted**

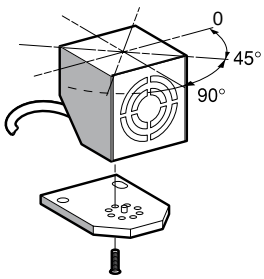


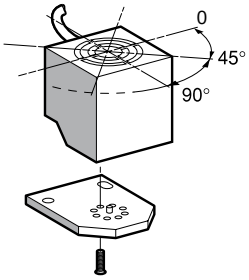

**Bracket mounted**

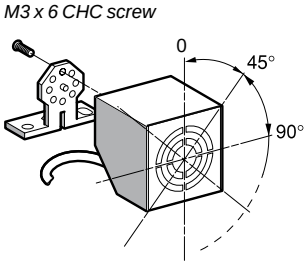


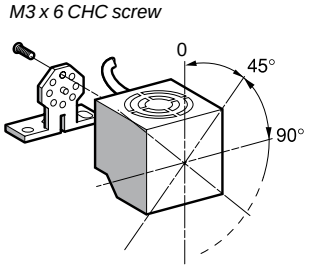

*(1) LED.*

**Alternative positions of head**



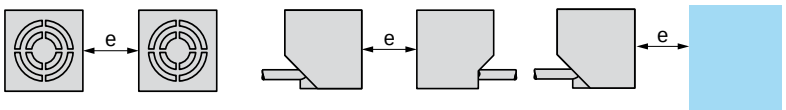



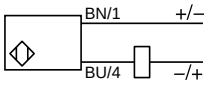
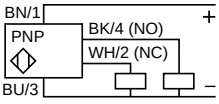
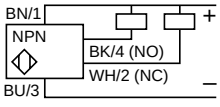

## Setting-up

**Minimum mounting distances (mm)**




| | | Side by side | Face to face | Facing a metal object |
|---|---|---|---|---|
| **Flush mountable in metal** | **XS7 T, 2-wire** | e ≥ 40 | e ≥ 120 | e ≥ 45 |
| | **XS7 T, 4-wire** | e ≥ 40 | e ≥ 120 | e ≥ 45 |
| **Non flush mountable in metal** | **XS8 T, 4-wire** | e ≥ 60 | e ≥ 160 | e ≥ 60 |

## Wiring schemes

| Connector | Pre-cabled | 2-wire ⎓, NO output | 4-wire ⎓, NO + NC output | |
|---|---|---|---|---|
|  | BU : Blue<br>BN : Brown<br>BK : Black<br>WH : White |  |  |  |









*See connection on page 9/45.*

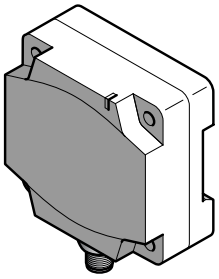
# Inductive proximity sensors

## Osiprox® Application

Flat sensor, flush mountable, increased range, 300 mA switching capacity
Form D, DIN rail mounting, solid-state output



| | | |
|---|---|---|
| **Sensor** | | **Flush mountable in metal** |



| | | |
|---|---|---|
| **Dimensions (mm)** | | 80 x 80 x 40 |
| **Nominal sensing distance (Sn)** | | 50 mm (not flush mounted: 42 mm) |
| **References** | | |
| **2-wire** ⎓ (non polarised) | NO | **XS7 D1A3CAM12DIN** |
| **Weight (kg)** | | 0.374 |
| **Characteristics** | | |
| **Product certifications** | | CE, CSA, UL: pending |
| **Degree of protection** | Conforming to IEC 60529 | IP 67 double insulation ⧈ |
| **Temperature** | Operation | - 25…+ 70 °C |
| | Storage | - 40…+ 85 °C |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) |
| **Shock resistance** | Conforming to IEC 60068-2-27 | 50 gn, duration 11 ms |
| **Connection** | | M12 connector |
| **Operating zone** | | **0…40 mm (not flush mounted: 0…35 mm)** |
| **Repeat accuracy** | | 3% of Sr |
| **Differential travel** | | 1…15% of Sr |
| **Output state indication** | | Yellow LED |
| **Rated supply voltage** | | ⎓ **12…48 V with protection against reverse polarity** |
| **Voltage limits (including ripple)** | | ⎓ 10…58 V |
| **Residual current, open state** | | ≤ 0.5 mA |
| **Switching capacity** | | **1.5…300 mA with overload and short-circuit protection** |
| **Voltage drop, closed state** | | ≤ 4.5 V |
| **Maximum switching frequency** | | 100 Hz |
| **Delays** | First-up | ≤ 10 ms |
| | Response | ≤ 2 ms |
| | Recovery | ≤ 5 ms |

# Inductive proximity sensors

Osiprox® Application

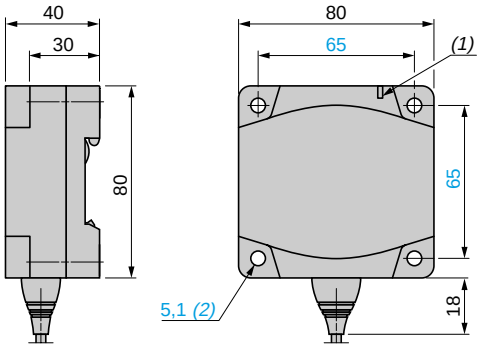
Flat sensor, flush mountable, increased range, 300 mA switching capacity

Form D, DIN rail mounting, solid-state output



## Dimensions

**XS7 D1A3CAM12DIN**

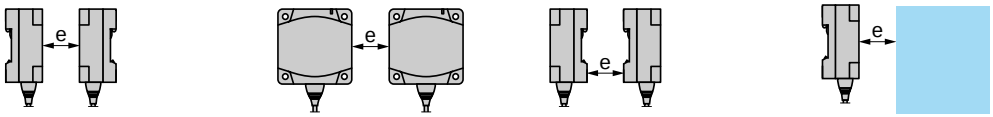



*(1) Output LED*

*(2) For CHC type screws*

## Setting-up

**Minimum mounting distances (mm)**




| | Face to face | Side by side | Back to back | Facing a metal object |
|---|---|---|---|---|
| **Flush mounted** | 450 | 140 | 90 | 150 |
| **Not flush mounted** | 450 | 180 | 180 | 150 |

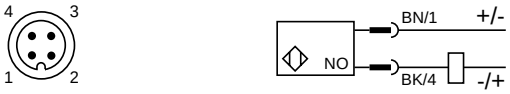
## Flush/non flush conditions

**In A37 steel**


| Sn | Su | Sn | Su |
|---|---|---|---|
| 42 mm | 35 mm | 50 mm | 40 mm |

## Wiring schemes

**2-wire NO/M12 XS7 D1A3CAM12DIN**




*See connection on page 9/45.*

# Inductive proximity sensors

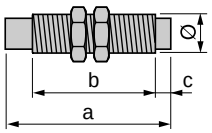
## Osiprox® Application

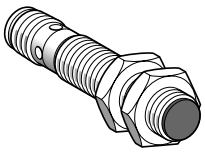
Sensors for welding machine applications *(1)*

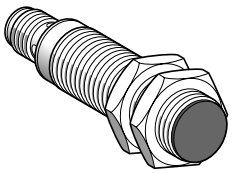
Cylindrical type. Metal case, Teflon coated steel, threaded



### Sensors flush mountable in metal





Lengths (mm):
a = Overall
b = Threaded section
c = For non flush mountable sensors

a = 60
b = 40
Ø = M12 x 1

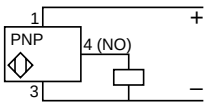
a = 60
b = 40
Ø = M18 x 1

| | | Teflon front face | Teflon front face |
|---|---|---|---|
| **Nominal sensing distance** (Sn) | | **2 mm** | **5 mm** |
| **References** | | | |
| **3-wire** ⎓ | PNP, NO | **XS1 M12PAW01D** | **XS1 M18PAW01D** |
| **Weight** (kg) | | 0.025 | 0.060 |
| **Characteristics** | | | |
| **Product certifications** | | CE, UL, CSA | |
| **Connection** | | **M12 connector** | |
| **Degree of protection** | Conforming to IEC 60529 | IP 67 | |
| **Operating zone** | | **0…1.6 mm** | **0…4 mm** |
| **Repeat accuracy** | | 3% of Sr | |
| **Differential travel** | | 1…20% of Sr | |
| **Operating temperature** | | - 25…+ 70 °C | |
| **Output state indication** | | Yellow LED, 4 viewing ports at 90° | |
| **Rated supply voltage** | | **⎓ 12…24 V with protection against reverse polarity** | |
| **Voltage limits** (including ripple) | | ⎓ 10…36 V | |
| **Switching capacity** | | **0...250 mA with overload and short-circuit protection** | |
| **Voltage drop, closed state** | | ≤ 2.5 V | |
| **Current consumption, no-load** | | ≤ 15 mA | |
| **Immunity to electromagnetic fields** | | ≤ 140 mT | |
| **Maximum switching frequency** | | 1000 Hz | 500 Hz |
| **Delays** | First-up | ≤ 10 ms | ≤ 10 ms |
| | Response | ≤ 0.1 ms | ≤ 0.2 ms |
| | Recovery | ≤ 0.4 ms | ≤ 0.6 ms |

### Wiring schemes

**M12 connector**


**3-wire ⎓, PNP, NO output**



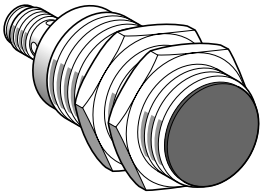
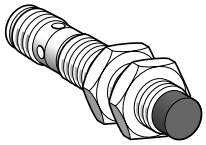

*See connection on page 9/45.*

*(1) Sensors particularly resistant to welding machine electromagnetic fields.*

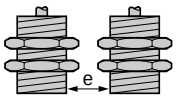
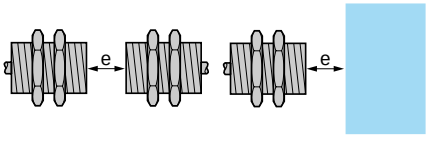
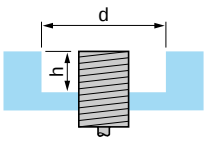
Accessories:
page 2/106

# Inductive proximity sensors
## Osiprox® Application
### Sensors for welding machine applications *(1)*
### Cylindrical type. Metal case, Teflon coated steel, threaded



| | Sensors non flush mountable in metal |
|---|---|
|  |  |
| a = 60<br>b = 40<br>Ø = M30 x 1.5 | a = 60<br>b = 36<br>c = 4<br>Ø = M12 x 1 |
| **Teflon front face** | **Teflon front face** |
| **10 mm** | **4 mm** |
| **XS1 M30PAW01D** | **XS2 M12PAW01D** |
| 0.145 | 0.025 |
| Ⓒ€, UL, CSA | |
| **M12 connector** | |
| IP 67 | |
| **0…8 mm** | **0…3.2 mm** |
| 3% of Sr | |
| 1…20% of Sr | |
| - 25…+ 70 °C | |
| Yellow LED, 4 viewing ports at 90° | |
| **⎓ 12…24 V with protection against reverse polarity** | |
| ⎓ 10…36 V | |
| **0…250 mA with overload and short-circuit protection** | |
| ⩽ 2.5 V | |
| ⩽ 15 mA | |
| ⩽ 140 mT | |
| 250 Hz | 1000 Hz |
| ⩽ 10 ms | ⩽ 10 ms |
| ⩽ 0.7 ms | ⩽ 0.2 ms |
| ⩽ 5 ms | ⩽ 0.4 ms |

## Setting-up

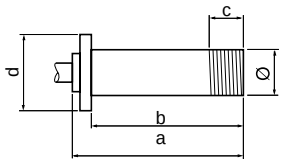
| Minimum mounting distances (mm) | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| |  |  | |  |
| **XS1 M12 flush mountable** | e ⩾ 0 | e ⩾ 7 | e ⩾ 6 | d ⩾ 12, h ⩾ 0 |
| **XS1 M18 flush mountable** | e ⩾ 0 | e ⩾ 16 | e ⩾ 9 | d ⩾ 18, h ⩾ 0 |
| **XS1 M30 flush mountable** | e ⩾ 0 | e ⩾ 20 | e ⩾ 20 | d ⩾ 30, h ⩾ 0 |
| **XS2 M12 non flush mountable** | e ⩾ 15 | e ⩾ 9 | e ⩾ 11 | d ⩾ 36, h ⩾ 8 |

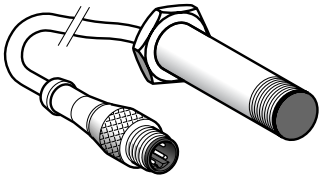
***Fixing nut tightening torque: XS1 M12, XS2 M12**: < 15 N.m, **XS1 M18**: < 35 N.m, **XS1 M30**: < 50 N.m*

# Inductive proximity sensors
## Application series
## Sensors for welding machine applications
## Cylindrical type. Metal case, plain, with shoulder



### Flush mountable in metal



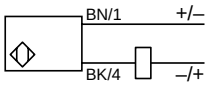
Lengths (mm) :
a = Overall
b = To shoulder
c = Removal
d = Ø shoulder

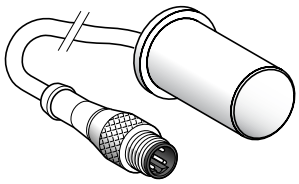
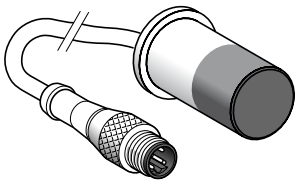
Ø = 12
a = 55
b = 50
c = 9 (threaded)
d = 15 hexagonal

| | | | | | |
|---|---|---|---|---|---|
| **Nominal sensing distance (Sn)** | | | **3 mm** | **3 mm** | **3 mm** |
| **References** | | | | | |
| **2-wire ⎓ (non polarised) Supply to terminals** | 1-4 | NO | **XSL C1401393L1** | **XSL C1401393L3** | **XSL C1401393L4** |
| **Weight (kg)** | | | 0.050 | 0.065 | 0.050 |
| **Characteristics** | | | | | |
| **Connection** | | | Remote M12 connector, length of cable: 1.2 m | Remote M12 connector, length of cable: 0.8 m | Remote M12 connector, length of cable: 0.15 m |
| **Degree of protection** conforming to IEC 60529 | | | IP 67 | | |
| **Operating zone** | | | 0…2.4 mm | | |
| **Repeat accuracy** | | | ≤ 3 % of Sr | | |
| **Differential travel** | | | 1…15 % of Sr | | |
| **Operating temperature** | | | - 25…+ 80 °C | | |
| **Output state indication** | | | LED (yellow), annular | | |
| **Rated supply voltage** | | | ⎓ 12…48 V | | |
| **Voltage limits** (including ripple) | | | ⎓ 10…58 V | | |
| **Switching capacity** | | | 1.5…100 mA with overload and short-circuit protection | | |
| **Voltage drop, closed state** | | | ≤ 4 V | | |
| **Residual current, open state** | | | ≤ 0.5 mA | | |
| **Current consumption, no load** | | | – | | |
| **Maximum switching frequency** | | | 800 Hz | | |
| **Delays** | | | First-up : ≤ 5 ms ; response : 0.5 ms ; recovery : ≤ 0.5 ms | | |

## Wiring schemes

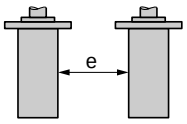
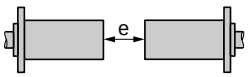
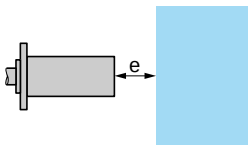
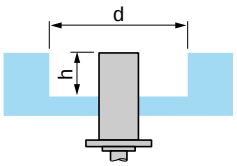
**2-wire ⎓ , non polarised, NO output**



| Flush mountable in metal | Non flush mountable in metal | |
|---|---|---|
|  |  | |
| Ø = 18<br>a = 40<br>b = 35<br>c = 0 (PPS front face)<br>d = Ø 22 | Ø = 18<br>a = 45<br>b = 35<br>c = 20 (Teflon front face and case)<br>d = Ø 22 | |
| **6.3 mm** | **10 mm** | **10 mm** |
| **XSL C1401392L1** | **XSL C1401405L3** | **XSL C1401405L4** |
| 0.100 | 0.065 | 0.050 |
| Remote M12 connector, length of cable: 1.2 m | Remote M12 connector, length of cable: 0.8 m | Remote M12 connector, length of cable: 0.15 m |
| IP 67 | | |
| 0…5 mm | 0…8 mm | |
| 3 % of Sr | | |
| 1…15 % of Sr | | |
| - 25…+ 70 °C | | |
| LED (yellow), annular | | |
| ⎓ 12…48 V | | |
| ⎓ 10…58 V | | |
| 1.5…100 mA with overload and short-circuit protection | | |
| ≤ 4 V | | |
| ≤ 0.5 mA | | |
| – | | |
| 100 Hz | | |
| First-up : ≤ 10 ms ; response : ≤ 10 ms ; recovery : ≤ 2 ms | | |

## Setting up

**Minimum mounting distances** (mm)

| | | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|---|
| | |  |  |  |  |
| **XSL C** | **Ø 12 (flush mountable)** | e ≥ 10 | e ≥ 60 | e ≥ 15 | d = 12, h = 0 |
| | **Ø 18 (non flush mountable)** | e ≥ 16 | e ≥ 96 | e ≥ 24 | d = 54, h = 16 |

# Inductive proximity sensors

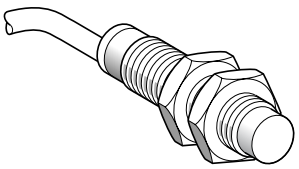
## Osiprox® Application, food and beverage processing series

Cylindrical, stainless steel, non flush mountable

Three-wire, d.c. supply, solid-state output

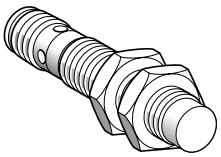


DF532016



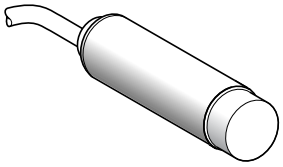
*XS2 ●●SA●●L2*

DF532015



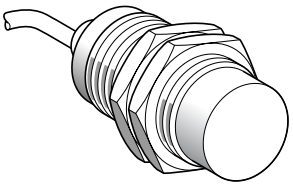
*XS2 ●●SA●●M12*

534440



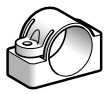
*XS2 L2SA●●L2*

822116



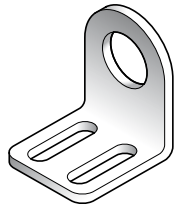
*XS2 30SA●●L2*

503663



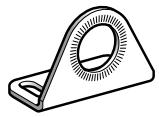
*XUZ B2005*

523363



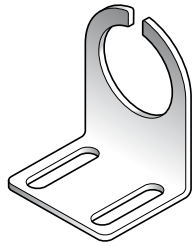
*XSZ BS12*

805817



*XUZ A118*

503663



*XSZ BS30*

### Ø 12, threaded M12 x 1

| Sensing dist. (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **7** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 12SAPAL2** | 0.075 |
| | | | M12 connector | **XS2 12SAPAM12** | 0.035 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 12SANAL2** | 0.075 |
| | | | M12 connector | **XS2 12SANAM12** | 0.035 |

### Ø 18, threaded M18 x 1

| Sensing dist. (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **12** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 18SAPAL2** | 0.120 |
| | | | M12 connector | **XS2 18SAPAM12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 18SANAL2** | 0.120 |
| | | | M12 connector | **XS2 18SANAM12** | 0.060 |

### Ø 18, plain

| Sensing dist. (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **12** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 L2SAPAL2** | 0.120 |
| | | | M12 connector | **XS2 L2SAPAM12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 L2SANAL2** | 0.120 |
| | | | M12 connector | **XS2 L2SANAM12** | 0.060 |

### Ø 30, threaded M30 x 1.5

| Sensing dist. (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **22** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 30SAPAL2** | 0.205 |
| | | | M12 connector | **XS2 30SAPAM12** | 0.145 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 30SANAL2** | 0.205 |
| | | | M12 connector | **XS2 30SANAM12** | 0.145 |

### Accessories *(2)*

| Description | For use with | Reference | Weight kg |
|---|---|---|---|
| **Plastic fixing clamp,** 24.1 mm centres, with locking screw | Ø 18 sensor, plain case | **XUZ B2005** | 0.007 |
| **Stainless steel fixing bracket** | Ø 12 sensor | **XSZ BS12** | 0.060 |
| | Ø 18 sensor | **XUZ A118** | 0.045 |
| | Ø 30 sensor | **XSZ BS30** | 0.080 |

### Connecting cables

| Description | Type | Cable length m | Reference | Weight kg |
|---|---|---|---|---|
| **Pre-wired M12 connectors** Female, 4-pin, stainless steel clamping ring | Straight | 2 | **XZC PA1141L2** | 0.090 |
| | | 5 | **XZC PA1141L5** | 0.210 |
| | | 10 | **XZC PA1141L10** | 0.410 |
| | Elbowed | 2 | **XZC PA1241L2** | 0.090 |
| | | 5 | **XZC PA1241L5** | 0.210 |
| | | 10 | **XZC PA1241L10** | 0.410 |
| **M12 jumper cable** Male, 3-pin, stainless steel clamping ring | Straight | 2 | **XZC RA151140A2** | 0.095 |
| | | 5 | **XZC RA151140A5** | 0.200 |

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS2 12SAPAL2** becomes **XS2 12SAPAL5** with a 5 m long cable.*

*(2) For further information, see page 2/106.*

# Inductive proximity sensors

Osiprox® Application, food and beverage processing series

Cylindrical, stainless steel, non flush mountable

Three-wire, d.c. supply, solid-state output



## Characteristics

| Sensor type | | | XS2 ●●SA●●M12 | XS2 ●●SA●●L2 |
|---|---|---|---|---|
| **Product certifications/approvals** | | | UL, CSA, CE | |
| **Connection** | Connector | | M12 | – |
| | Pre-cabled | | – | Length: 2 m |
| **Operating zone** | Ø 12 | **mm** | **0…5.6** | |
| | Ø 18 | **mm** | **0…9.6** | |
| | Ø 30 | **mm** | **0…17.6** | |
| **Differential travel** | | **%** | 1...15 of real sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | IP 68, double insulation ⧈ |
| | DIN 40050 | | IP 69 K | |
| **Storage temperature** | | **°C** | - 40…+ 85 *(1)* | |
| **Operating temperature** | | **°C** | - 25…+ 85 | |
| **Materials** | Case | | Stainless steel, grade 316 L | |
| | Cable | | – | Non-poisonous PVC, 3 x 0.34 mm² |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Output state indication** | | | Yellow LED: 4 viewing ports at 90° | Yellow LED: annular |
| **Rated supply voltage** | | **V** | ⎓ 12…24 with protection against reverse polarity | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…36 | |
| **Switching capacity** | | **mA** | ⩽ 200 with overload and short-circuit protection | |
| **Voltage drop, closed state** | | **V** | ⩽ 2 | |
| **Current consumption, no-load** | | **mA** | ⩽ 10 | |
| **Maximum switching frequency** | **XS2 12SA●●●●** | **Hz** | 2500 | |
| | **XS2 18SA●●●●** and **XS2 L2●●●●** | **Hz** | 1000 | |
| | **XS2 30SA●●●●** | **Hz** | 500 | |
| **Delays** | First-up | **ms** | ⩽ 10 | |
| | Response | **ms** | ⩽ 0.2 Ø12, ⩽ 0.3 Ø18, ⩽ 0.6 Ø30 | |
| | Recovery | **ms** | ⩽ 0.2 Ø12, ⩽ 0.7 Ø18, ⩽ 1.4 Ø30 | |

*(1) + 100 °C for cleaning and sterilization phases whilst not in service.*

## Wiring schemes

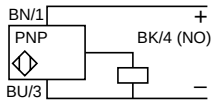
**Connector**

M12

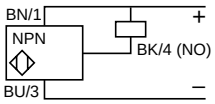

**Pre-cabled**

BU: Blue
BN: Brown
BK: Black

**PNP**

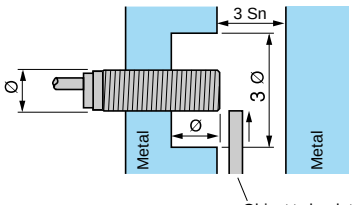



**NPN**

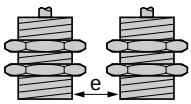


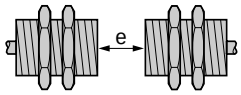

*See connection on page 9/45.*

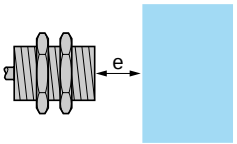
## Setting-up




**Minimum mounting distances (mm)**



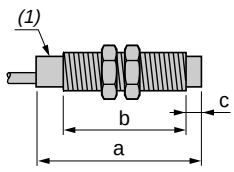




| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 12 | e ⩾ 48 | e ⩾ 84 | e ⩾ 21 |
| Ø 18 | e ⩾ 72 | e ⩾ 144 | e ⩾ 36 |
| Ø 30 | e ⩾ 120 | e ⩾ 264 | e ⩾ 66 |

## Dimensions

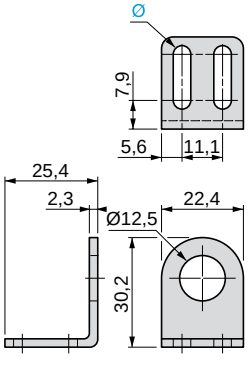
**XS2**



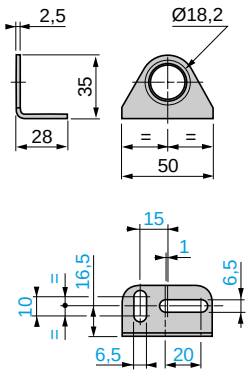

*(1) LED*

| XS2 | Pre-cabled (mm) a | b | Connector (mm) a | b | c |
|---|---|---|---|---|---|
| Ø 12 | 54.5 | 38 | 61 | 37 | 5 |
| Ø 18 | 60 | 40 | 70 | 42 | 8 |
| Ø 30 | 62.5 | 41 | 70 | 36 | 13 |

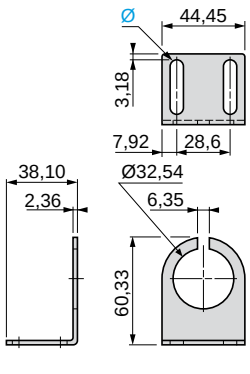
**XSZ BS12**




**XUZ A118**




**XSZ BS30**




*Ø : 2 elongated holes Ø 7.14 x 29.36*

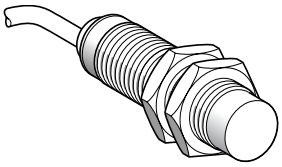
# Inductive proximity sensors

## Osiprox® Application, food and beverage processing series

Cylindrical, stainless steel, non flush mountable
Two-wire, a.c. or d.c. supply

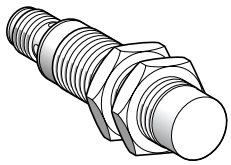


523361



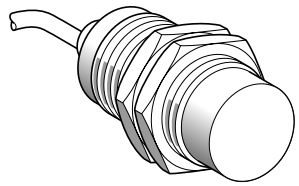
*XS2 18SAM●L2*

523362



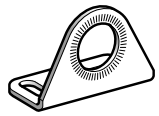
*XS2 18SAM●U20*

523218



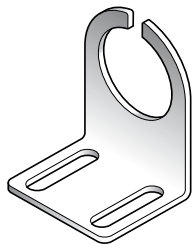
*XS2 30SAM●L2*

805817



*XUZ A118*

523364



*XSZ BS30*

### Ø 18, threaded M18 x 1

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **12** | NO | Pre-cabled (L = 2 m) *(1)* | **XS2 18SAMAL2** | 0.120 |
| | | 1/2” - 20UNF connector | **XS2 18SAMAU20** | 0.060 |

### Ø 30, threaded M30 x 1.5

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **22** | NO | Pre-cabled (L = 2 m) *(1)* | **XS2 30SAMAL2** | 0.205 |
| | | 1/2” - 20UNF connector | **XS2 30SAMAU20** | 0.145 |

### Connecting cables *(2)*

| Description | Type | Cable length m | Reference | Weight kg |
|---|---|---|---|---|
| **Pre-wired connectors** 1/2” - 20UNF 3-pin female, stainless steel clamping ring | Straight | 5 | **XZC PA1865L5** | 0.210 |
| | | 10 | **XZC PA1865L10** | 0.410 |
| | Elbowed | 5 | **XZC PA1965L5** | 0.250 |
| | | 10 | **XZC PA1965L10** | 0.485 |

### Accessories

| Description | For use with | Reference | Weight kg |
|---|---|---|---|
| **Stainless steel fixing bracket** | Ø 18 sensor | **XUZ A118** | 0.045 |
| | Ø 30 sensor | **XSZ BS30** | 0.080 |

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS2 18SAMAL2** becomes **XS2 18SAMAL5** with a 5 m long cable.*
*(2) For further information, see page 2/106.*

# Inductive proximity sensors

Osiprox® Application, food and beverage processing series

Cylindrical, stainless steel, non flush mountable

Two-wire, a.c. or d.c. supply



## Characteristics

| Sensor type | | | XS2 ●●SAM●U20 | XS2 ●●SAM●L2 |
|---|---|---|---|---|
| **Product certifications/approvals** | | | UL, CSA, CE | |
| **Connection** | Connector | | 1/2" - 20UNF | – |
| | Pre-cabled | | – | Length: 2 m |
| **Operating zone** | Ø 18 | **mm** | **0…9.6** | |
| | Ø 30 | **mm** | **0...17.6** | |
| **Differential travel** | | **%** | 1...15 of real sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | IP 68, double insulation ⧈ |
| | DIN 40050 | | IP 69 K | |
| **Storage temperature** | | **°C** | - 40…+ 85 *(1)* | |
| **Operating temperature** | | **°C** | - 25…+ 85 | |
| **Materials** | Case | | Stainless steel, grade 316 L | |
| | Cable | | – | Non-poisonous PVC, 2 x 0.34 mm² |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Output state indication** | | | Yellow LED: 4 viewing ports at 90° | Yellow LED: annular |
| **Rated supply voltage** | | **V** | ∿ or ⎓ 24…240 (∿ 50/60 Hz) | |
| **Voltage limits (including ripple)** | | **V** | ∿ or ⎓ 20…264 | |
| **Switching capacity** | | **mA** | ∿ 5…300 or ⎓ 5…200 *(2)* | |
| **Voltage drop, closed state** | | **V** | ⩽ 5.5 | |
| **Residual current, open state** | | **mA** | ⩽ 0.8 | |
| **Maximum switching frequency** | **XS2 18SAM●●●** | **Hz** | ∿ 25 or ⎓ 1000 | |
| | **XS2 30SAM●●●** | **Hz** | ∿ 25 or ⎓ 300 | |
| **Delays** | First-up | **ms** | ⩽ 30 | |
| | Response | **ms** | ⩽ 0.5 | |
| | Recovery | **ms** | ⩽ 0.5 **XS2 18SAM●●●**, ⩽ 2 **XS2 30SAM●●●** | |

*(1) + 100 °C for cleaning and sterilization phases whilst not in service.*

*(2) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.*

## Wiring schemes

**Connector**

1/2" - 20UNF


AC/DC : 2
⏚ : 1
AC/DC : 3

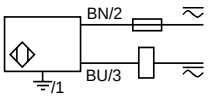
*See connection on page 9/45.*

**Pre-cabled**

BU: Blue
BN: Brown

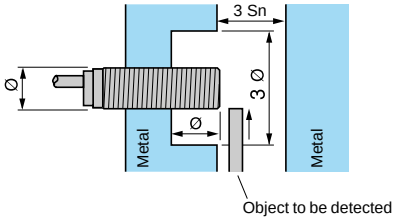
**2-wire ∿ or ⎓**

**NO output**

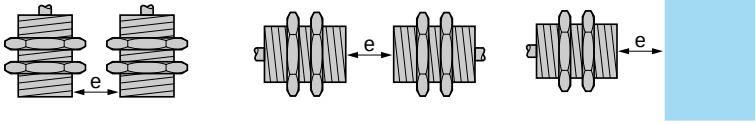



*⏚: on connector models only*

## Setting-up



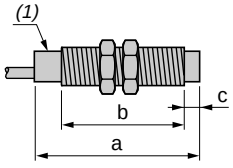

**Minimum mounting distances (mm)**




| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 18 | e ⩾ 72 | e ⩾ 144 | e ⩾ 36 |
| Ø 30 | e ⩾ 120 | e ⩾ 264 | e ⩾ 66 |

## Dimensions

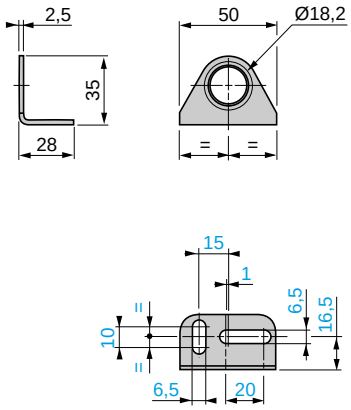
**XS2**



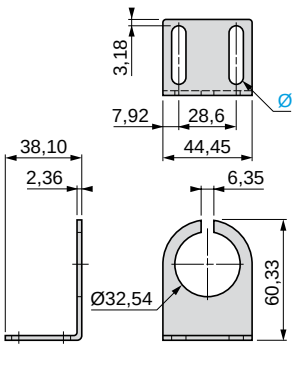

*(1) LED*

| XS2 | Pre-cabled (mm) a | Pre-cabled (mm) b | Connector (mm) a | Connector (mm) b | Connector (mm) c |
|---|---|---|---|---|---|
| Ø 18 | 60 | 40 | 72 | 44 | 8 |
| Ø 30 | 62.5 | 41 | 74 | 40 | 13 |

**XSZ A118**




**XSZ BS30**




*Ø: 2 elongated holes Ø 7.14 x 29.36*

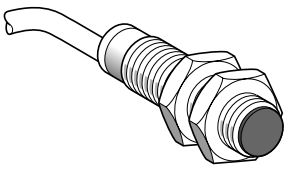
# Inductive proximity sensors

## Osiprox® Application, food and beverage processing series

Cylindrical, plastic, non flush mountable
Three-wire, d.c. supply, solid-state output

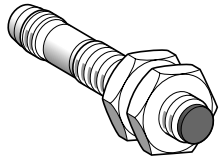


DF536159



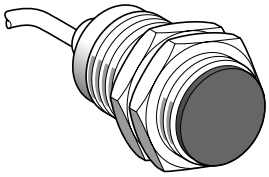
*XS2 ●●AA●●L2*

801167



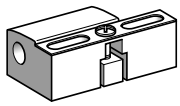
*XS2 ●●AA●●M12*

DF535161



*XS2 30AA●●L2*

825994



*XSZ B●●●*

### Ø 12, threaded M12 x 1

| Sensing dist. (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **7** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 12AAPAL2** | 0.065 |
| | | | M12 connector | **XS2 12AAPAM12** | 0.030 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 12AANAL2** | 0.065 |
| | | | M12 connector | **XS2 12AANAM12** | 0.030 |

### Ø 18, threaded M18 x 1

| Sensing dist. (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **12** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 18AAPAL2** | 0.100 |
| | | | M12 connector | **XS2 18AAPAM12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 18AANAL2** | 0.100 |
| | | | M12 connector | **XS2 18AANAM12** | 0.040 |

### Ø 30, threaded M30 x 1.5

| Sensing dist. (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **22** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2 30AAPAL2** | 0.140 |
| | | | M12 connector | **XS2 30AAPAM12** | 0.080 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2 30AANAL2** | 0.140 |
| | | | M12 connector | **XS2 30AANAM12** | 0.080 |

### Accessories *(2)*

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 12 | **XSZ B112** | 0.006 |
| | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

### Connecting cables

| Description | Type | Cable length m | Reference | Weight kg |
|---|---|---|---|---|
| **Pre-wired M12 connectors** Female, 4-pin, stainless steel clamping ring | Straight | 2 | **XZC PA1141L2** | 0.090 |
| | | 5 | **XZC PA1141L5** | 0.190 |
| | | 10 | **XZC PA1141L10** | 0.370 |
| | Elbowed | 2 | **XZC PA1241L2** | 0.090 |
| | | 5 | **XZC PA1241L5** | 0.190 |
| | | 10 | **XZC PA1241L10** | 0.370 |
| **M12 jumper cable** Male, 3-pin, stainless steel clamping ring | Straight | 2 | **XZC RA151140A2** | 0.090 |
| | | 5 | **XZC RA151140A5** | 0.190 |

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS2 12AAPAL2** becomes **XS2 12AAPAL5** with a 5 m long cable.*
*(2) For further information, see page 2/106.*

# Inductive proximity sensors

Osiprox® Application, food and beverage processing series

Cylindrical, plastic, non flush mountable

Three-wire, d.c. supply, solid-state output



## Characteristics

| Sensor type | | | XS2 ●●AA●●M12 | XS2 ●●AA●●L2 |
|---|---|---|---|---|
| **Product certifications/approvals** | | | UL, CSA, CE | |
| **Connection** | Connector | | M12 | – |
| | Pre-cabled | | – | Length: 2 m |
| **Operating zone** | Ø 12 | **mm** | **0…5.6** | |
| | Ø 18 | **mm** | **0…9.6** | |
| | Ø 30 | **mm** | **0…17.6** | |
| **Differential travel** | | **%** | 1...15 of real sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | IP 68, double insulation ⧈ |
| | DIN 40050 | | IP 69 K | |
| **Storage temperature** | | **°C** | - 40…+ 85 | |
| **Operating temperature** | | **°C** | - 25…+ 85 | |
| **Materials** | Case | | PPS | |
| | Cable | | – | PvR and 3 x 0.34 mm² |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Output state indication** | | | Yellow LED: annular | |
| **Rated supply voltage** | | **V** | ⎓ 12…48 for T - 25…+ 85 °C | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…58 for T - 25…+ 85 °C | |
| **Switching capacity** | | **mA** | ⩽ 200 with overload and short-circuit protection | |
| **Voltage drop, closed state** | | **V** | ⩽ 2 | |
| **Current consumption, no-load** | | **mA** | ⩽ 10 | |
| **Maximum switching frequency** | **XS2 12AA●●●●** | **Hz** | 2500 | |
| | **XS2 18AA●●●●** | **Hz** | 1000 | |
| | **XS2 30AA●●●●** | **Hz** | 500 | |
| **Delays** | First-up | **ms** | ⩽ 10 | |
| | Response | **ms** | ⩽ 0.2 Ø12, ⩽ 0.3 Ø18, ⩽ 0.6 Ø30 | |
| | Recovery | **ms** | ⩽ 0.2 Ø12, ⩽ 0.7 Ø18, ⩽ 1.4 Ø30 | |

## Wiring schemes

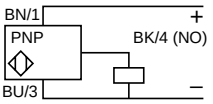
**Connector**

M12

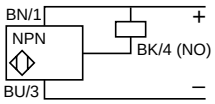

**Pre-cabled**

BU: Blue
BN: Brown
BK: Black

**PNP**

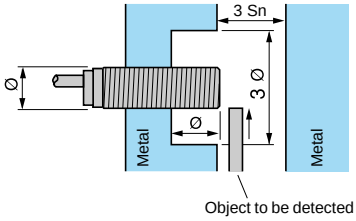



**NPN**

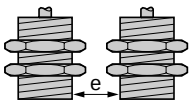


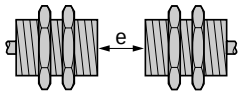

*See connection on page 9/45.*

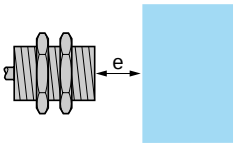
## Setting-up




**Minimum mounting distances (mm)**

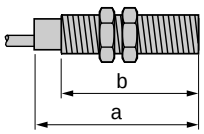



| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 12 | e ⩾ 48 | e ⩾ 84 | e ⩾ 21 |
| Ø 18 | e ⩾ 72 | e ⩾ 144 | e ⩾ 36 |
| Ø 30 | e ⩾ 120 | e ⩾ 264 | e ⩾ 66 |

## Dimensions




**XS2**

| XS2 | Pre-cabled (mm) | | Connector (mm) | |
|---|---|---|---|---|
| | a | b | a | b |
| Ø 12 | 50 | 42 | 61 | 43 |
| Ø 18 | 60 | 51 | 70 | 52 |
| Ø 30 | 60 | 51 | 70 | 52 |

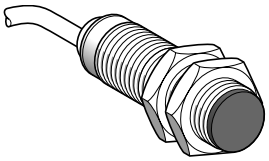
# Inductive proximity sensors

## Osiprox® Application, food and beverage processing series

Cylindrical, plastic, non flush mountable
Two-wire, a.c. or d.c. supply

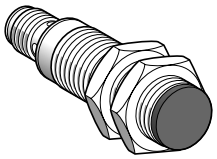


535156



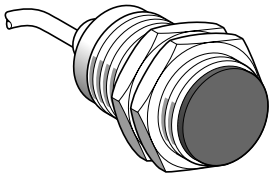
*XS2 ●●AAM●L2*

523382



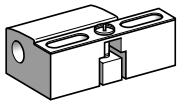
*XS2 ●●AAM●U20*

535158



*XS2 30AAM●L2*

825994



*XSZ B1●●*

### Ø 18, threaded M18 x 1

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **12** | NO | Pre-cabled (L = 2 m) *(1)* | **XS2 18AAMAL2** | 0.100 |
| | | 1/2" - 20UNF connector | **XS2 18AAMAU20** | 0.040 |

### Ø 30, threaded M30 x 1.5

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **22** | NO | Pre-cabled (L = 2 m) *(1)* | **XS2 30AAMAL2** | 0.140 |
| | | 1/2" - 20UNF connector | **XS2 30AAMAU20** | 0.080 |

### Accessories *(2)*

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 18 | **XSZ B118** | 0.010 |
| | Ø 30 | **XSZ B130** | 0.020 |

### Connecting cables

| Description | Type | Cable length m | Reference | Weight kg |
|---|---|---|---|---|
| **Pre-wired connectors** 1/2" - 20UNF 3-pin female, stainless steel 316 L clamping ring | Straight | 5 | **XZC PA1865L5** | 0.180 |
| | | 10 | **XZC PA1865L10** | 0.350 |
| | Elbowed | 5 | **XZC PA1965L5** | 0.180 |
| | | 10 | **XZC PA1965L10** | 0.350 |

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS2 18AAMAL2** becomes **XS2 18AAMAL5** with a 5 m long cable.*
*(2) For further information, see page 2/106.*

# Inductive proximity sensors

## Osiprox® Application, food and beverage processing series

Cylindrical, plastic case, non flush mountable
Two-wire, a.c. or d.c. supply



## Characteristics

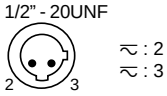
| Sensor type | | | XS2 ●●AAM●U20 | XS2 ●●AAM●L2 |
|---|---|---|---|---|
| **Product certifications/approvals** | | | UL, CSA, CE | |
| **Connection** | Connector | | 1/2" - 20UNF | – |
| | Pre-cabled | | – | Length: 2 m |
| **Operating zone** | Ø 18 | **mm** | **0…9.6** | |
| | Ø 30 | **mm** | **0...17.6** | |
| **Differential travel** | | **%** | 1...15 of real sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | IP 68, double insulation ⧈ |
| | DIN 40050 | | IP 69K | |
| **Storage temperature** | | **°C** | - 40…+ 85 | |
| **Operating temperature** | | **°C** | - 25…+ 85 | |
| **Materials** | Case | | PPS | |
| | Cable | | – | PvR and 2 x 0.34 mm² |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn, duration 11 ms | |
| **Output state indication** | | | Yellow LED: annular | |
| **Rated supply voltage** | | **V** | ∿ or ⎓ 24…240 (∿ 50/60 Hz) | |
| **Voltage limits (including ripple)** | | **V** | ∿ or ⎓ 20…264 | |
| **Switching capacity** | | **mA** | ∿ 5…300 or ⎓ 5…200 *(1)* | |
| **Voltage drop, closed state** | | **V** | ≤ 5.5 | |
| **Residual current, open state** | | **mA** | ≤ 0.8 | |
| **Maximum switching frequency** | **XS2 18AAM●●●** | **Hz** | ∿ 25 or ⎓ 1000 | |
| | **XS2 30AAM●●●** | **Hz** | ∿ 25 or ⎓ 300 | |
| **Delays** | First-up | **ms** | ≤ 30 | |
| | Response | **ms** | ≤ 0.5 | |
| | Recovery | **ms** | ≤ 0.5 **XS2 18AAM●●●**, ≤ 2 **XS2 30AAM●●●** | |

*(1) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.*

## Wiring schemes

**Connector**

1/2" - 20UNF



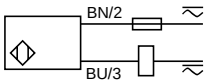

⎓ : 2
⎓ : 3

**Pre-cabled**

BU: Blue
BN: Brown

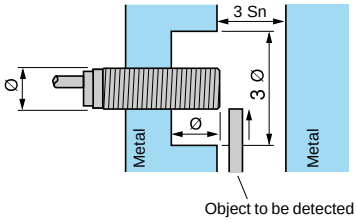
**2-wire ∿ or ⎓**

**NO output**

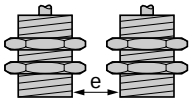


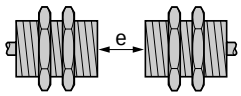

*See connection on page 9/45.*

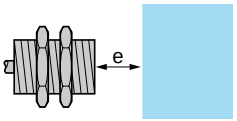
## Setting-up




**Minimum mounting distances (mm)**



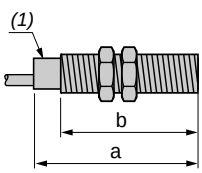




| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 18 | e ≥ 72 | e ≥ 144 | e ≥ 36 |
| Ø 30 | e ≥ 120 | e ≥ 264 | e ≥ 66 |

## Dimensions

**XS2**

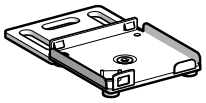


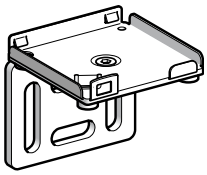

*(1) LED*

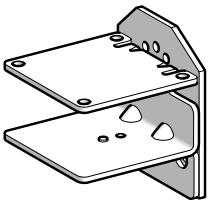
| XS2 | Pre-cabled (mm) | | Connector (mm) | |
|---|---|---|---|---|
| | a | b | a | b |
| Ø 18 | 60 | 51 | 70 | 52 |
| Ø 30 | 60 | 51 | 70 | 52 |

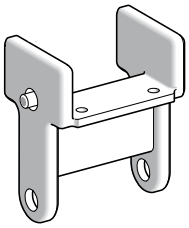
# Inductive proximity sensors
Osiprox®
Accessories

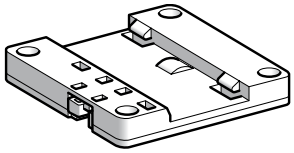


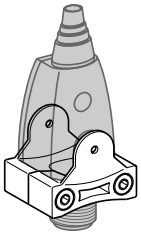
520691

XSZ B●00

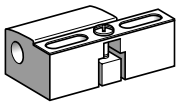
561454

XSZ B●90

520695

XSZ BC10

520694

XSZ BE10

562271

XSZ BD10

562270

XSZ BPM12

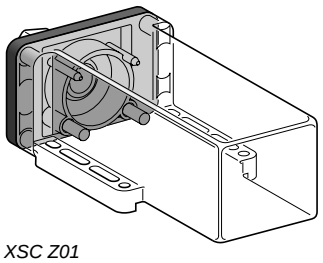
825994

XSZ B1●●

825996

XSZ A0●●

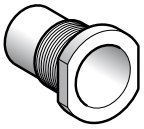
825995

XSZ P1●●

825997

XSC Z01

520935

XSZ F10

821980

XTA Z30

## Mounting and fixing accessories

| Description | For use with sensors | | Unit reference | Weight kg |
|---|---|---|---|---|
| | Type | Diameter (mm) | | |
| **"Clip" mounting plate** Mounting possible without "clip" on tapped holes | XS● J | – | **XSZ BJ00** | 0.003 |
| | XS● F | – | **XSZ BF00** | 0.005 |
| | XS● E | – | **XSZ BE00** | 0.025 |
| | XS● C | – | **XSZ BC00** | 0.060 |
| **"Clip" 90° mounting bracket** Mounting possible without "clip" on tapped holes | XS● J | – | **XSZ BJ90** | 0.003 |
| | XS● F | – | **XSZ BF90** | 0.005 |
| | XS● E | – | **XSZ BE90** | 0.025 |
| | XS● C | – | **XSZ BC90** | 0.060 |
| **Replacement bracket** | XS● E Replaced: XS7 T2, XS8 T2, XSE | – | **XSZ BE10** | 0.060 |
| | XS● C Replaced: XS7 T4, XS7 C40, XS8 T4, XS8 C40 and XSC | – | **XSZ BC10** | 0.110 |
| | XS● D (for XSD) *(1)* | – | **XSZ BD10** | 0.065 |
| **Fixing clamp for remote control** | XS9, XS6●●●B2 | – | **XSZ BPM12** | 0.015 |
| **Fixing clamps** | XS1 | 4 (smooth) | **XSZ B104** | 0.005 |
| | | 5 (M5 x 0.5) | **XSZ B105** | 0.005 |
| | XS1, XS2 | 6.5 (smooth) | **XSZ B165** | 0.005 |
| | XS1, XS2, XS4, XS5, XS6 | 8 (M8 x 1) | **XSZ B108** | 0.006 |
| | XS1, XS2, XS4, XS5, XS6, XT1, XT4 | 12 (M12 x 1) | **XSZ B112** | 0.006 |
| | | 18 (M18 x 1) | **XSZ B118** | 0.010 |
| | | 30 (M30 x 1.5) | **XSZ B130** | 0.020 |
| | XT1, XT4 | 32 (smooth) | **XUZ B32** | 0.050 |
| **Set of 2 fixing nuts, metal nickel chromed** | XS1 | 5 (M5 x 0.5) | **XSZ E105** | 0.010 |
| | XS1, XS2, XS5, XS6 | 8 (M8 x 1) | **XSZ E108** | 0.015 |
| | XS1, XS2, XT1, XS5, XS6 | 12 (M12 x 1) | **XSZ E112** | 0.015 |
| | | 18 (M18 x 1) | **XSZ E118** | 0.020 |
| | | 30 (M30 x 1.5) | **XSZ E130** | 0.050 |
| **Set of 2 fixing nuts, stainless steel** | XS1, XS2, XS5, XS6 | 8 (M8 x 1) | **XSZ E308** | 0.015 |
| | XS1, XS2, XT1, XS5, XS6 | 12 (M12 x 1) | **XSZ E312** | 0.015 |
| | | 18 (M18 x 1) | **XSZ E318** | 0.020 |
| | | 30 (M30 x 1.5) | **XSZ E330** | 0.050 |
| **Set of 2 fixing nuts, plastic** | XS4 | 8 (M8 x 1) | **XSZ E208** | 0.002 |
| | | 12 (M12 x 1) | **XSZ E212** | 0.003 |
| | XS4, XT4 | 18 (M18 x 1) | **XSZ E218** | 0.004 |
| | | 30 (M30 x 1.5) | **XSZ E230** | 0.005 |
| **Adaptor collar** **Ø 20** | XS●, XT● | 18 (M18 x 1) | **XSZ A020** | 0.005 |
| **Ø 34** | XS●, XT● | 30 (M30 x 1.5) | **XSZ A034** | 0.005 |

## Protection accessories

| | | | | |
|---|---|---|---|---|
| **Cable sleeve adaptor** (CNOMO type) | XS●, XT● | 12 (M12 x 1) | **XSZ P112** | 0.005 |
| | | 18 (M18 x 1) | **XSZ P118** | 0.005 |
| | | 30 (M30 x 1.5) | **XSZ P130** | 0.010 |
| **Outer cover (IP 68)** | XT7 C | – | **XSC Z01** | 0.100 |
| **Thread adaptor** | XS●, XT● | 30 (M30 x 1.5) | **XTA Z30** | 0.035 |
| **No. 13 plastic cable gland** | Clamping capacity Ø 9 to 12 mm | | **XSZ PE13** | 0.010 |
| **Protective cover** Sold in lots of 50 | M12 universal connectors | | **XSZ F10** | 0.020 |

## Mounting parts

| | | | | |
|---|---|---|---|---|
| **Thread inserts for rear fixing** | XS●E | M3 | **XSZ VF03** | 0.002 |
| | XS●C | M4 | **XSZ VF04** | 0.005 |
| | XS●D | M5 | **XSZ VF05** | 0.006 |

## Fuses (for unprotected 2-wire ⎓/∿ sensors)

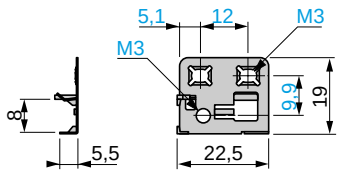
| Description | Type | Sold in lots of | Unit reference | Weight kg |
|---|---|---|---|---|
| **Cartridge fuses 5 x 20** | 0.4 A "quick-blow" | 10 | **XUZ E04** | 0.001 |
| | 0.63 A "quick-blow" | 10 | **XUZ E06** | 0.001 |
| | 0.8 A "quick-blow" | 10 | **XUZ E08** | 0.001 |
| **Fuse terminal block for XUZ E0●** | | 50 | **AB1 FU10135U** | 0.040 |

*(1) Depth adjustment block for converting from 80 x 80 x 26 mm format to 80 x 80 x 40 mm format. Also enables clipping onto 35 mm "omega" rail.*

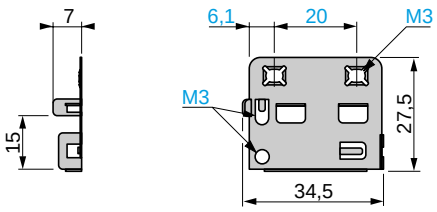
# Inductive proximity sensors
Osiprox®
Accessories



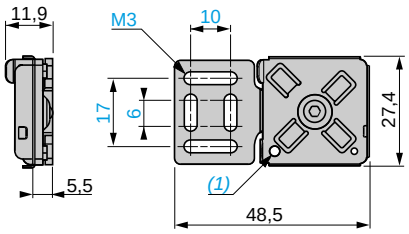
### XSZ BJ00



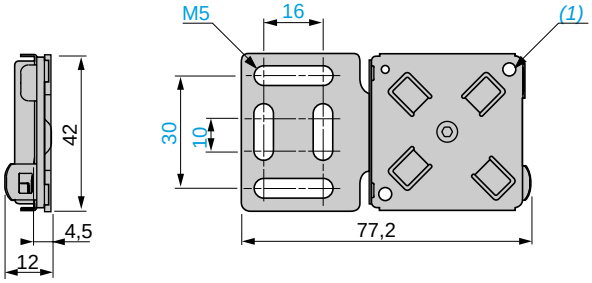

### XSZ BF00




### XSZ BE00



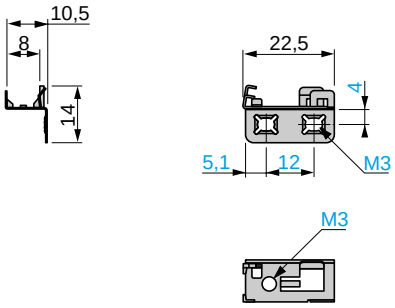

### XSZ BC00



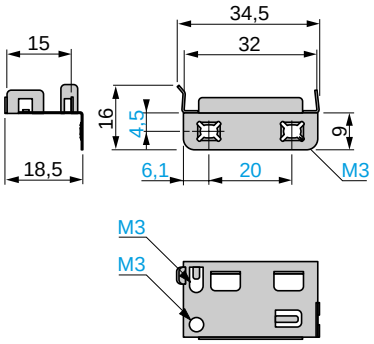

*(1) 2 M3 x 12 screws supplied.*

*(1) 4 M4 x 14 screws supplied.*

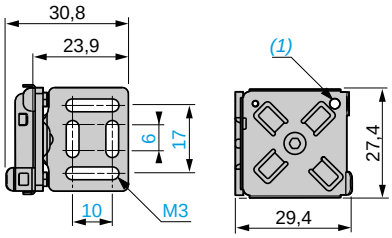
### XSZ BJ90



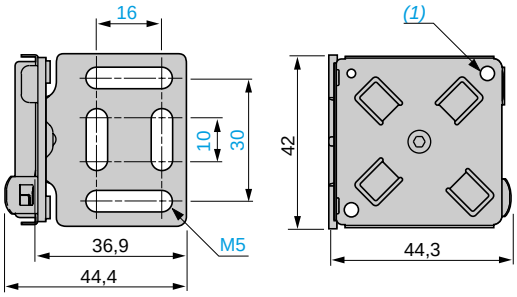

### XSZ BF90




### XSZ BE90




### XSZ BC90

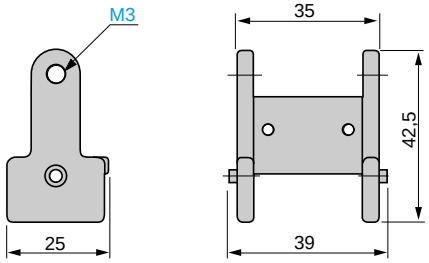



*(1) 2 M3 x 12 screws supplied.*

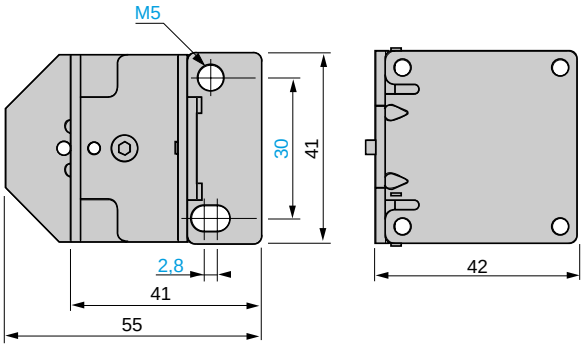
*(1) 4 M4 x 14 screws supplied.*

2

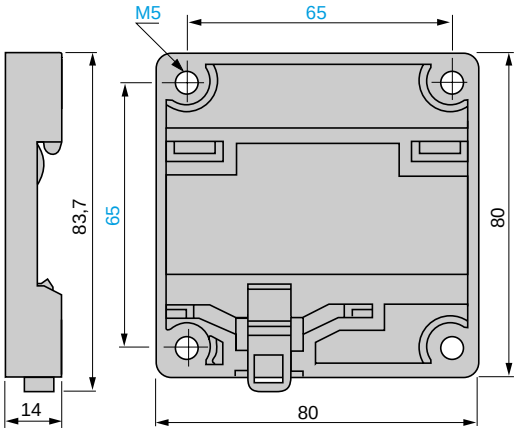
### XSZ BE10



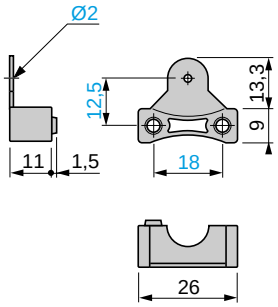

### XSZ BC10



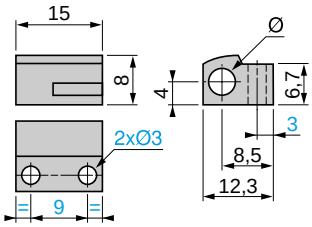

### XSZ BD10 (for mounting on XS● D●●●●)




### XSZ BPM12



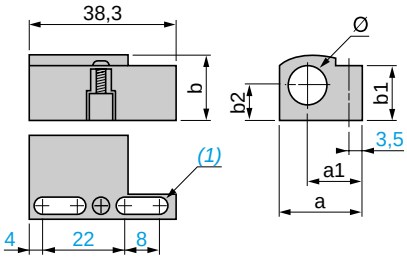

### XSZ-B104, B105




| XSZ | Ø |
|---|---|
| **B104** | 4 |
| **B105** | 5 |

***Note:*** *for saddle clamps XSZ B118 and XSZ B130, see setting-up recommendations page 2/17.*

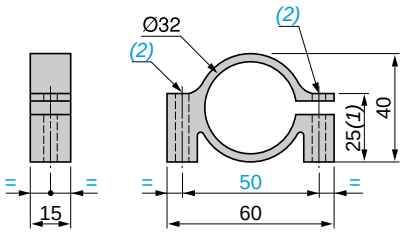
### XSZ-B108, B112, B118, B130, B165




| XSZ | a | a1 | b | b1 | b2 | Ø |
|---|---|---|---|---|---|---|
| **B108** | 19.9 | 14.5 | 14 | 12.5 | 7.5 | 8 |
| **B112** | 21.9 | 14.5 | 16 | 15.5 | 8.5 | 12 |
| **B118** | 26 | 15.7 | 22.3 | 20.1 | 11.5 | 18 |
| **B130** | 39 | 21.7 | 35.5 | 31 | 18.5 | 30 |
| **B165** | 19.9 | 14.5 | 14 | 12.5 | 7.5 | 6.5 |

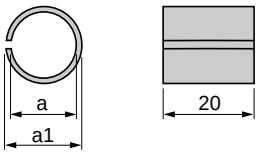
*(1) 2 elongated holes Ø 4 x 8 mm.*

### XUZ B32



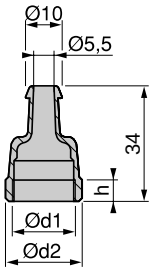

*(1) Maximum value*
*(2) 2 holes Ø 5.5*
*Clamp supplied with two M5 screws, HM head*

### XSZ A0●●



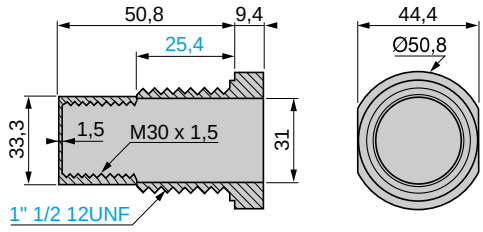

| XSZ | a | a1 |
|---|---|---|
| **A020** | Ø18 | Ø20 |
| **A034** | Ø30 | Ø34 |

### XSZ P112, P118, P130

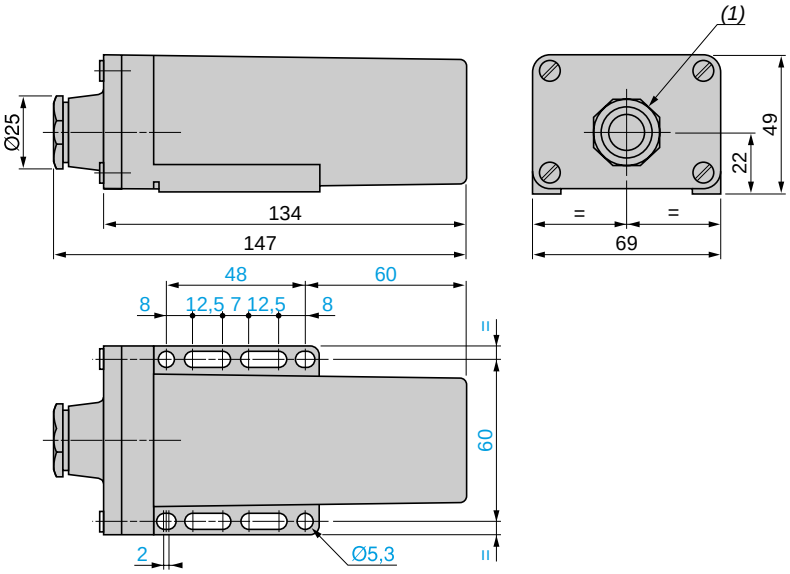



| XSZ | h | Ø d1 | Ø d2 |
|---|---|---|---|
| **P112** | 7 | 12 | 16.8 |
| **P118** | 6.2 | 18 | 23 |
| **P130** | 6.2 | 30 | 34.4 |

### XTA Z30




### XSC Z01

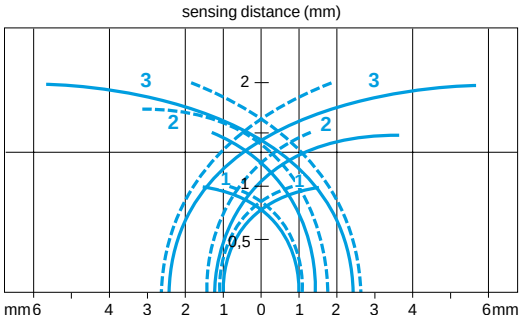



*(1) No. 13 plastic cable gland*

2

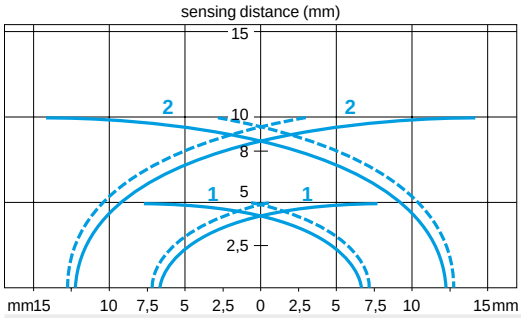
## Cylindrical type proximity sensors

### Flush mountable in metal




| Sensor (mm) | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **Ø 4** | 5 x 5 x 1 | 0…0.8 |
| **Ø 5** | 5 x 5 x 1 | 0…0.8 |
| **Ø 6.5** | 8 x 8 x 1 | 0…1.2 |
| **Ø 8** | 8 x 8 x 1 | 0…1.2 |
| **Ø 12** | 12 x 12 x 1 | 0…1.6 |

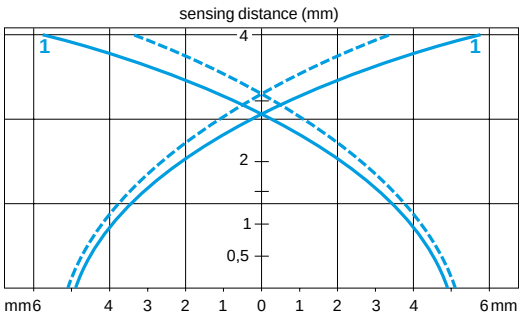
*pick-up points*
*drop-out points (object approaching from the side)*
*1 Ø 4 (plain) XS1 and Ø 5 (M5 x 0.5) XS1*
*2 Ø 6.5 (plain) XS1 and Ø 8 (M8 x 1) XS5*
*3 Ø 12 (M12 x 1) XS5*




| Sensor (mm) | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **Ø 18** | 18 x 18 x 1 | 0…4 |
| **Ø 30** | 30 x 30 x 1 | 0…8 |

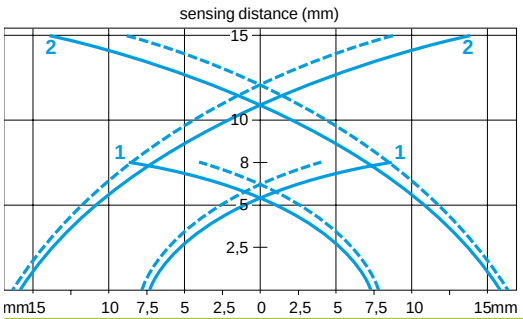
*pick-up points*
*drop-out points (object approaching from the side)*
*1 Ø 18 (M18 x 1) XS5*
*2 Ø 30 (M30 x 1.5) XS5*

### Non flush mountable in metal




| Sensor (mm) | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **Ø 12** | 12 x 12 x 1 | 0…3.2 |

*pick-up points*
*drop-out points (object approaching from the side)*
*1 Ø 12 (M12 x 1) XS4*

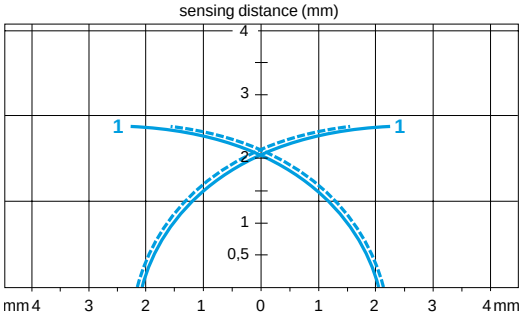



| Sensor (mm) | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **Ø 18** | 24 x 24 x 1 | 0…6.4 |
| **Ø 30** | 45 x 45 x 1 | 0…12 |

*pick-up points*
*drop-out points (object approaching from the side)*
*1 Ø 18 (M18 x 1), XS4*
*2 Ø 30 (M30 x 1.5), XS4*

## Cylindrical type proximity sensors with increased sensing range

### Flush mountable in metal

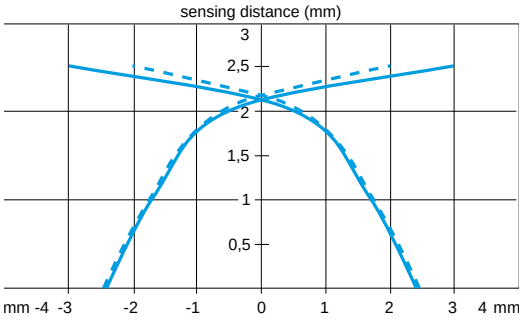



| Sensor (mm) | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **Ø 6.5** | 8 x 8 x 1 | 0…2 |

*pick-up points*
*drop-out points (object approaching from the side)*
*1 Ø 6.5 (plain) XS1 L06●●349*

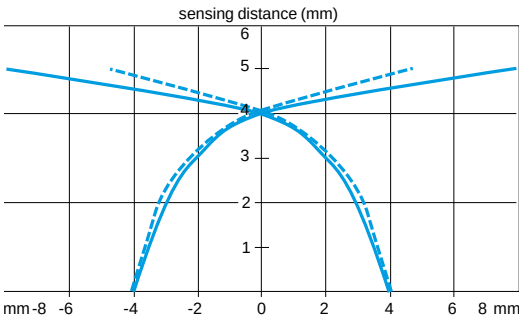
## Flat type proximity sensors

### Flush mountable in metal




| Sensor (mm) | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **XS7 J1A1D** | 5 x 5 x 1 | 0...2 |

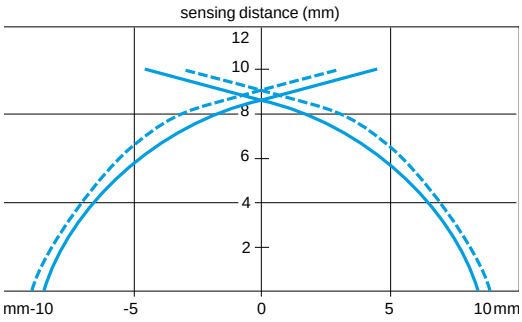
*pick-up points*
*drop-out points (object approaching from the side)*




| Sensor (mm) | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **XS7 F1A1D** | 5 x 5 x 1 | 0...4 |

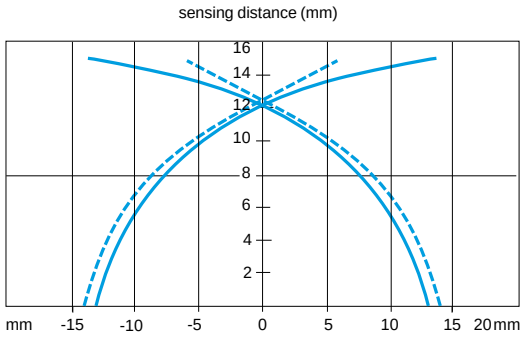
*pick-up points*
*drop-out points (object approaching from the side)*

### Non flush mountable in metal



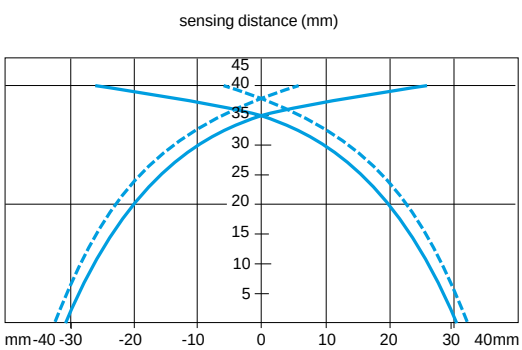

| Sensor (mm) | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **XS7 E1A1D** | 8 x 8 x 1 | 0...8 |
| **XS7 E1A1C** | 8 x 8 x 1 | 0...8 |

*pick-up points*
*drop-out points (object approaching from the side)*




| Sensor (mm) | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **XS7 C1A1D** | 18 x 18 x 1 | 0...12 |
| **XS7 C1A1C** | 18 x 18 x 1 | 0...12 |

*pick-up points*
*drop-out points (object approaching from the side)*




| Sensor (mm) | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **XS7 D1A1D** | 30 x 30 x 1 | 0...32 |
| **XS7 D1A1C** | 30 x 30 x 1 | 0...32 |

*pick-up points*
*drop-out points (object approaching from the side)*

# Substitution table
## Sensors with closest functionalities

# Inductive proximity sensors

### Cylindrical type, d.c. supply

| Old sensor | New Osiprox sensor |
|---|---|
| **Diameter 6.5 mm** | |
| XS1L06NA140 | **XS106BLNAL2** |
| XS1L06PA140 | **XS106BLPAL2** |
| **Diameter 8 mm** | |
| XS1D08NA140 | **XS108BLNAL2** |
| XS1D08NA140D | **XS108BLNAM12** |
| XS1D08PA140 | **XS108BLPAL2** |
| XS1D08PA140D | **XS108BLPAM12** |
| XS1D08PA140L1 | **XS108BLPAL5** |
| XS1M08DA210 | **XS508B1DAL2** |
| XS1M08DA210D | **XS508B1DAM12** |
| XS1M08DA210L1 | **XS508B1DAL5** |
| XS1M08DA210L2 | **XS508B1DAL10** |
| XS1M08DA210LD | **XS508B1DAM12** *(1)* |
| XS1M08DA214D | **XS508B1CAM12** |
| XS1M08DA214LD | **XS508B1CAL08M12** |
| XS1M08DB210 | **XS508B1DBL2** |
| XS1M08DB210D | **XS508B1DBM12** |
| XS1M08DB210L1 | **XS508B1DBL5** |
| XS1M08DB210LD | **XS508B1DBM12** *(1)* |
| XS1M08NA370 | **XS608B1NAL2** |
| XS1M08NA370D | **XS608B1NAM12** |
| XS1M08NA370L1 | **XS608B1NAL5** |
| XS1M08NB370 | **XS608B1NBL2** |
| XS1M08NB370D | **XS608B1NBM12** |
| XS1M08PA370 | **XS608B1PAL2** |
| XS1M08PA370D | **XS608B1PAM12** |
| XS1M08PA370L1 | **XS608B1PAL5** |
| XS1M08PA370L2 | **XS608B1PAL10** |
| XS1M08PA370LD | **XS608B1PAM12** *(1)* |
| XS1M08PA370S | **XS608B1PAM12** *(2)* |
| XS1M08PB370 | **XS608B1PBL2** |
| XS1M08PB370D | **XS608B1PBM12** |
| XS1M08PB370L1 | **XS608B1PBL5** |
| XS1M08PB370L2 | **XS608B1PBL10** |
| XS1N08NA340 | **XS508B1NAL2** |
| XS1N08NA340D | **XS508B1NAM8** *(3)* |
| XS1N08NA340L1 | **XS508B1NAL5** |
| XS1N08NA340L2 | **XS508B1NAL10** |
| XS1N08NA340S | **XS508B1NAM8** |
| XS1N08NB340 | **XS508B1NBL2** |
| XS1N08NB340D | **XS508B1NBM8** *(3)* |
| XS1N08NB340S | **XS508B1NBM8** |
| XS1N08PA340 | **XS508B1PAL2** |
| XS1N08PA340D | **XS508B1PAM8** *(3)* |
| XS1N08PA340L1 | **XS508B1PAL5** |
| XS1N08PA340L2 | **XS508B1PAL10** |
| XS1N08PA340LD | **XS508B1PAM8** *(3)* |
| XS1N08PA340S | **XS508B1PAM8** |
| XS1N08PB340 | **XS508B1PBL2** |
| XS1N08PB340D | **XS508B1PBM8** *(3)* |
| XS1N08PB340L1 | **XS508B1PBL5** |
| XS1N08PB340L2 | **XS508B1PBL10** |
| XS1N08PB340S | **XS508B1PBM8** |
| XS2M08NA340 | **XS608B1NAL2** |
| XS2N08NA340 | **XS1N08NA349** |
| XS2N08NA340D | **XS1N08NA349D** |
| XS2N08NA340L1 | **XS1N08NA349L1** |
| XS2N08NA340L2 | **XS1N08NA349L2** |
| XS2N08NA340S | **XS1N08NA349S** |
| XS2N08NB340 | **XS1N08NB349** |
| XS2N08NB340D | **XS1N08NB349D** |
| XS2N08NB340S | **XS1N08NB349S** |
| XS2N08PA340 | **XS1N08PA349** |
| XS2N08PA340D | **XS1N08PA349D** |
| XS2N08PA340L1 | **XS1N08PA349L1** |
| XS2N08PA340L2 | **XS1N08PA349L2** |
| XS2N08PA340S | **XS1N08PA349S** |
| XS2N08PB340 | **XS1N08PB349** |
| XS2N08PB340D | **XS1N08PB349D** |
| XS2N08PB340S | **XS1N08PB349S** |
| XS3P08NA340 | **XS508B1NAL2** *(4)* |
| XS3P08NA340D | **XS508B1NAM8** *(3)(4)* |
| XS3P08NA340L1 | **XS508B1NAL5** *(4)* |
| XS3P08NA370 | **XS608B1NAL2** *(4)* |
| XS3P08NA370L1 | **XS608B1NAL5** *(4)* |
| XS3P08PA340 | **XS508B1PAL2** *(4)* |
| XS3P08PA340D | **XS508B1PAM8** *(3)* *(4)* |
| XS3P08PA340L1 | **XS508B1PAL5** *(4)* |
| XS3P08PA370 | **XS608B1PAL2** *(4)* |
| XS3P08PA370L1 | **XS608B1PAL5** *(4)* |
| **Diameter 12 mm** | |
| XS1D12NA140 | **XS112BLNAL2** |
| XS1D12NA140D | **XS112BLNAM12** |
| XS1D12PA140 | **XS112BLPAL2** |
| XS1D12PA140D | **XS112BLPAM12** |
| XS1D12PA140L1 | **XS112BLPAL5** |
| XS2D12NA140 | **XS212BLNAL2** |
| XS2D12NA140D | **XS212BLNAM12** |
| XS2D12NA140L1 | **XS212BLNAL5** |
| XS2D12PA140 | **XS212BLPAL2** |
| XS2D12PA140D | **XS212BLPAM12** |
| XS2D12PA140L1 | **XS212BLPAL5** |
| XS1M12DA210 | **XS512B1DAL2** |
| XS1M12DA210D | **XS512B1DAM12** |
| XS1M12DA210L1 | **XS512B1DAL5** |
| XS1M12DA210L2 | **XS512B1DAL10** |
| XS1M12DA210LD | **XS512B1DAM12** *(1)* |
| XS1M12DA214D | **XS512B1CAM12** |
| XS1M12DA214LD | **XS512B1CAL08M12** |
| XS1M12DB210 | **XS512B1DBL2** |
| XS1M12DB210D | **XS512B1DBM12** |
| XS1M12DB210L1 | **XS512B1DBL5** |
| XS1M12DB210L2 | **XS512B1DBL10** |
| XS1M12DB210LD | **XS512B1DBM12** *(1)* |
| XS1M12NA370 | **XS612B1NAL2** |
| XS1M12NA370D | **XS612B1NAM12** |
| XS1M12NA370L1 | **XS612B1NAL5** |
| XS1M12NA370L2 | **XS612B1NAL10** |
| XS1M12NA370S | **XS612B1NAM12** *(2)* |
| XS1M12NB370 | **XS612B1NBL2** |
| XS1M12NB370D | **XS612B1NBM12** |
| XS1M12PA370 | **XS612B1PAL2** |
| XS1M12PA370D | **XS612B1PAM12** |
| XS1M12PA370L1 | **XS612B1PAL5** |
| XS1M12PA370L2 | **XS612B1PAL10** |
| XS1M12PA370LD | **XS612B1PAM12** *(1)* |
| XS1M12PB370 | **XS612B1PBL2** |
| XS1M12PB370D | **XS612B1PBM12** |
| XS1M12PB370L1 | **XS612B1PBL5** |
| XS1M12PB370L2 | **XS612B1PBL10** |
| XS1M12PB370LD | **XS612B1PAM12** *(1)* |
| XS1N12NA340 | **XS512B1NAL2** |
| XS1N12NA340D | **XS512B1NAM12** |
| XS1N12NA340L1 | **XS512B1NAL5** |
| XS1N12NA340L2 | **XS512B1NAL10** |
| XS1N12NB340 | **XS512B1NBL2** |
| XS1N12NB340D | **XS512B1NBM12** |

*(1) For the new sensor an integral M12 connector replaces the M12 connector on a 0.80 m flying lead.*
*(2) For the new sensor an M12 connector replaces the M8 connector.*
*(3) For the new sensor an M8 connector replaces the M12 connector.*
*(4) For the new Osiprox® sensor the metal case replaces the plastic case.*

**Cylindrical type, d.c. supply** (continued)

**Diameter 12 mm**

| *Old sensor* | **New Osiprox sensor** |
|---|---|
| *XS1N12PA340* | **XS512B1PAL2** |
| *XS1N12PA340D* | **XS512B1PAM12** |
| *XS1N12PA340L1* | **XS512B1PAL5** |
| *XS1N12PA340L2* | **XS512B1PAL10** |
| *XS1N12PA340LD* | **XS512B1PAM12** *(1)* |
| *XS1N12PA340S* | **XS512B1PAM12** *(2)* |
| *XS1N12PB340* | **XS512B1PBL2** |
| *XS1N12PB340D* | **XS512B1PBM12** |
| *XS1N12PB340L1* | **XS512B1PBL5** |
| *XS2M12NA370* | **XS612B1NAL2** |
| *XS2M12NA370D* | **XS612B1NAM12** |
| *XS2M12NA370L1* | **XS612B1NAL5** |
| *XS2M12NA370L2* | **XS612B1NAL10** |
| *XS2M12NB370* | **XS612B1NBL2** |
| *XS2M12NB370D* | **XS612B1NBM12** |
| *XS2M12PA370* | **XS612B1PAL2** |
| *XS2M12PA370D* | **XS612B1PAM12** |
| *XS2M12PA370L1* | **XS612B1PAL5** |
| *XS2M12PA370L2* | **XS612B1PAL10** |
| *XS2M12PB370* | **XS612B1PBL2** |
| *XS2M12PB370D* | **XS612B1PBM12** |
| *XS2M12PB370L1* | **XS612B1PBL5** |
| *XS2M12PB370S* | **XS612B1PBM12** *(2)* |
| *XS2N12NA340* | **XS1N12NA349** |
| *XS2N12NA340D* | **XS1N12NA349D** |
| *XS2N12NA340L1* | **XS1N12NA349L1** |
| *XS2N12NA340L2* | **XS1N12NA349L2** |
| *XS2N12NB340* | **XS1N12NB349** |
| *XS2N12NB340D* | **XS1N12NB349D** |
| *XS2N12PA340* | **XS1N12PA349** |
| *XS2N12PA340D* | **XS1N12PA349D** |
| *XS2N12PA340L1* | **XS1N12PA349L1** |
| *XS2N12PA340L2* | **XS1N12PA349L2** |
| *XS2N12PB340* | **XS1N12PB349** |
| *XS2N12PB340D* | **XS1N12PB349D** |
| *XS2N12PB340L1* | **XS1N12PB349L1** |
| *XS3P12NA340* | **XS512B1NAL2** *(4)* |
| *XS3P12NA340D* | **XS512B1NAM12** *(4)* |
| *XS3P12NA340L1* | **XS512B1NAL5** *(4)* |
| *XS3P12NA370* | **XS612B1NAL2** *(4)* |
| *XS3P12NA370L1* | **XS612B1NAL5** *(4)* |
| *XS3P12PA340* | **XS512B1PAL2** *(4)* |
| *XS3P12PA340D* | **XS512B1PAM12** *(4)* |
| *XS3P12PA340L1* | **XS512B1PAL5** *(4)* |
| *XS3P12PA370* | **XS612B1PAL2** *(4)* |
| *XS3P12PA370L1* | **XS612B1PAL5** *(4)* |

**Diameter 18 mm**

| *Old sensor* | **New Osiprox sensor** |
|---|---|
| *XS1D18NA140* | **XS118BLNAL2** |
| *XS1D18NA140D* | **XS118BLNAM12** |
| *XS1D18NA140L1* | **XS118BLNAL5** |
| *XS1D18PA140* | **XS118BLPAL2** |
| *XS1D18PA140D* | **XS118BLPAM12** |
| *XS1D18PA140L1* | **XS118BLPAL5** |
| *XS2D18NA140* | **XS218BLNAL2** |
| *XS2D18NA140D* | **XS218BLNAM12** |
| *XS2D18PA140* | **XS218BLPAL2** |
| *XS2D18PA140D* | **XS218BLPAM12** |
| *XS2D18PA140L1* | **XS218BLPAL5** |
| *XS1M18DA210* | **XS518B1DAL2** |
| *XS1M18DA210D* | **XS518B1DAM12** |
| *XS1M18DA210L1* | **XS518B1DAL5** |
| *XS1M18DA210L2* | **XS518B1DAL10** |
| *XS1M18DA210LD* | **XS518B1DAM12** *(1)* |
| *XS1M18DA214D* | **XS518B1CAM12** |
| *XS1M18DA214LD* | **XS518B1CAL08M12** |
| *XS1M18DB210* | **XS518B1DBL2** |
| *XS1M18DB210D* | **XS518B1DBM12** |
| *XS1M18DB210LD* | **XS518B1DBM12** *(1)* |
| *XS1M18NA370* | **XS618B1NAL2** |
| *XS1M18NA370D* | **XS618B1NAM12** |
| *XS1M18NA370L1* | **XS618B1NAL5** |
| *XS1M18NA370L2* | **XS618B1NAL10** |
| *XS1M18NB370* | **XS618B1NBL2** |
| *XS1M18NB370D* | **XS618B1NBM12** |
| *XS1M18NB370L1* | **XS618B1NBL5** |
| *XS1M18NB370L2* | **XS618B1NBL10** |
| *XS1M18PA370* | **XS618B1PAL2** |
| *XS1M18PA370D* | **XS618B1PAM12** |
| *XS1M18PA370L1* | **XS618B1PAL5** |
| *XS1M18PA370L2* | **XS618B1PAL10** |
| *XS1M18PA370LD* | **XS618B1PAM12** *(1)* |
| *XS1M18PB370* | **XS618B1PBL2** |
| *XS1M18PB370D* | **XS618B1PBM12** |
| *XS1M18PB370L1* | **XS618B1PBL5** |
| *XS1M18PB370L2* | **XS618B1PBL10** |
| *XS1N18NA340* | **XS518B1NAL2** |
| *XS1N18NA340D* | **XS518B1NAM12** |
| *XS1N18NA340L1* | **XS518B1NAL5** |
| *XS1N18NA340L2* | **XS518B1NAL10** *(6)* |
| *XS1N18NB340* | **XS518B1NBL2** |
| *XS1N18NB340D* | **XS518B1NBM12** |
| *XS1N18NB340L2* | **XS518B1NBL10** |
| *XS1N18PA340* | **XS518B1PAL2** |
| *XS1N18PA340D* | **XS518B1PAM12** |
| *XS1N18PA340L1* | **XS518B1PAL5** |
| *XS1N18PA340L2* | **XS518B1PAL10** |
| *XS1N18PB340* | **XS518B1PBL2** |
| *XS1N18PB340D* | **XS518B1PBM12** |
| *XS1N18PB340L2* | **XS518B1PBL10** |
| *XS2M18NA370* | **XS618B1NAL2** |
| *XS2M18NA370D* | **XS618B1NAM12** |
| *XS2M18NA370L1* | **XS618B1NAL5** |
| *XS2M18NA370L2* | **XS618B1NAL10** |
| *XS2M18NB370* | **XS618B1NBL2** |
| *XS2M18NB370D* | **XS618B1NBM12** |
| *XS2M18NB370L1* | **XS618B1NBL5** |
| *XS2M18NB370L2* | **XS618B1NBL10** |
| *XS2M18PA370* | **XS618B1PAL2** |
| *XS2M18PA370D* | **XS618B1PAM12** |
| *XS2M18PA370L1* | **XS618B1PAL5** |
| *XS2M18PA370L2* | **XS618B1PAL10** |
| *XS2M18PB370* | **XS618B1PBL2** |
| *XS2M18PB370D* | **XS618B1PBM12** |
| *XS2M18PB370L1* | **XS618B1PBL5** |
| *XS2M18PB370L2* | **XS618B1PBL10** |
| *XS2N18NA340* | **XS1N18NA349** *(8)* |
| *XS2N18NA340D* | **XS1N18NA349D** *(8)* |
| *XS2N18NA340L1* | **XS1N18NA349L1** *(8)* |
| *XS2N18NA340L2* | **XS1N18NA349L2** *(8)* |
| *XS2N18NB340* | **XS1N18NB349** *(8)* |
| *XS2N18NB340D* | **XS1N18NB349D** *(8)* |
| *XS2N18PA340* | **XS1N18PA349** *(8)* |
| *XS2N18PA340D* | **XS1N18PA349D** *(8)* |
| *XS2N18PA340L1* | **XS1N18PA349L1** *(8)* |
| *XS2N18PA340L2* | **XS1N18PA349L2** *(8)* |
| *XS2N18PB340* | **XS1N18PB349** *(8)* |
| *XS2N18PB340D* | **XS1N18PB349D** *(8)* |
| *XS3P18NA340* | **XS518B1NAL2** *(4)* |
| *XS3P18NA340D* | **XS518B1NAM12** *(4)* |
| *XS3P18NA340L1* | **XS518B1NAL5** *(4)* |
| *XS3P18NA370* | **XS618B1NAL2** *(4)* |
| *XS3P18NA370L1* | **XS618B1NAL5** *(4)* |

*(1) For the new sensor an integral M12 connector replaces the M12 connector on a 0.80 m flying lead.*
*(2) For the new sensor an M12 connector replaces the M8 connector.*
*(4) For the new Osiprox® sensor the metal case replaces the plastic case.*
*(6) For the new Osiprox® sensor the length of the product is different.*
*(8) For the new sensor, Sn = 10 mm instead of 8 mm.*

2

| *Old sensor* | **New Osiprox sensor** |
|---|---|
| **Cylindrical type, d.c. supply** (continued) | |
| **Diameter 18 mm** | |
| *XS3P18PA340* | **XS518B1PAL2** *(4)* |
| *XS3P18PA340D* | **XS518B1PAM12** *(4)* |
| *XS3P18PA340L1* | **XS518B1PAL5** *(4)* |
| *XS3P18PA370* | **XS618B1PAL2** *(4)* |
| *XS3P18PA370L1* | **XS618B1PAL5** *(4)* |
| *XS3P18PA370L2* | **XS618B1PAL10** *(4)* |
| **Diameter 30 mm** | |
| *XS1D30NA140* | **XS130BLNAL2** |
| *XS1D30NA140D* | **XS130BLNAM12** |
| *XS1D30PA140* | **XS130BLPAL2** |
| *XS1D30PA140D* | **XS130BLPAM12** |
| *XS1D30PA140L1* | **XS130BLPAL5** |
| *XS2D30NA140* | **XS230BLNAL2** |
| *XS2D30NA140D* | **XS230BLNAM12** |
| *XS2D30PA140* | **XS230BLPAL2** |
| *XS2D30PA140D* | **XS230BLPAM12** |
| *XS1M30DA210* | **XS530B1DAL2** |
| *XS1M30DA210D* | **XS530B1DAM12** |
| *XS1M30DA210L1* | **XS530B1DAL5** |
| *XS1M30DA210L2* | **XS530B1DAL10** |
| *XS1M30DA210LD* | **XS530B1DAM12** *(1)* |
| *XS1M30DA214D* | **XS530B1CAM12** |
| *XS1M30DA214LD* | **XS530B1CAL08M12** |
| *XS1M30DB210* | **XS530B1DBL2** |
| *XS1M30DB210D* | **XS530B1DBM12** |
| *XS1M30DB210LD* | **XS530B1DBM12** *(1)* |
| *XS1M30NA370* | **XS630B1NAL2** |
| *XS1M30NA370D* | **XS630B1NAM12** |
| *XS1M30NA370L1* | **XS630B1NAL5** |
| *XS1M30NA370L2* | **XS630B1NAL10** |
| *XS1M30NB370* | **XS630B1NBL2** |
| *XS1M30NB370D* | **XS630B1NBM12** |
| *XS1M30NB370L1* | **XS630B1NBL5** |
| *XS1M30NB370L2* | **XS630B1NBL10** |
| *XS1M30PA349D* | **XS630B1PAM12** *(5)* |
| *XS1M30PA370* | **XS630B1PAL2** |
| *XS1M30PA370D* | **XS630B1PAM12** |
| *XS1M30PA370L1* | **XS630B1PAL5** |
| *XS1M30PA370L2* | **XS630B1PAL10** |
| *XS1M30PA370LD* | **XS630B1PAM12** *(1)* |
| *XS1M30PB370* | **XS630B1PBL2** |
| *XS1M30PB370D* | **XS630B1PBM12** |
| *XS1M30PB370L1* | **XS630B1PBL5** |
| *XS1M30PB370L2* | **XS630B1PBL10** |

| *Old sensor* | **New Osiprox sensor** |
|---|---|
| *XS1N30NA340* | **XS530B1NAL2** |
| *XS1N30NA340D* | **XS530B1NAM12** |
| *XS1N30NA340L1* | **XS530B1NAL5** |
| *XS1N30NA340L2* | **XS530B1NAL10** |
| *XS1N30NB340* | **XS530B1NBL2** |
| *XS1N30NB340D* | **XS530B1NBM12** |
| *XS1N30PA340* | **XS530B1PAL2** |
| *XS1N30PA340D* | **XS530B1PAM12** |
| *XS1N30PA340L1* | **XS530B1PAL5** |
| *XS1N30PA340L2* | **XS530B1PAL10** |
| *XS1N30PB340* | **XS530B1PBL2** |
| *XS1N30PB340D* | **XS530B1PBM12** |
| *XS2M30NA370* | **XS630B1NAL2** |
| *XS2M30NA370D* | **XS630B1NAM12** |
| *XS2M30NA370L1* | **XS630B1NAL5** |
| *XS2M30NA370L2* | **XS630B1NAL10** |
| *XS2M30NB370* | **XS630B1NBL2** |
| *XS2M30NB370D* | **XS630B1NBM12** |
| *XS2M30NB370L1* | **XS630B1NBL5** |
| *XS2M30NB370L2* | **XS630B1NBL10** |
| *XS2M30PA370* | **XS630B1PAL2** |
| *XS2M30PA370D* | **XS630B1PAM12** |
| *XS2M30PA370L1* | **XS630B1PAL5** |
| *XS2M30PA370L2* | **XS630B1PAL10** |
| *XS2M30PB370* | **XS630B1PBL2** |
| *XS2M30PB370D* | **XS630B1PBM12** |
| *XS2M30PB370L1* | **XS630B1PBL5** |
| *XS2M30PB370L2* | **XS630B1PBL10** |
| *XS2N30NA340* | **XS1N30NA349** *(9)* |
| *XS2N30NA340D* | **XS1N30NA349D** *(9)* |
| *XS2N30NA340L1* | **XS1N30NA349L1** *(9)* |
| *XS2N30NA340L2* | **XS1N30NA349L2** *(9)* |
| *XS2N30NB340* | **XS1N30NB349** *(9)* |
| *XS2N30NB340D* | **XS1N30NB349D** *(9)* |
| *XS2N30PA340* | **XS1N30PA349** *(9)* |
| *XS2N30PA340D* | **XS1N30PA349D** *(9)* |
| *XS2N30PA340L1* | **XS1N30PA349L1** *(9)* |
| *XS2N30PA340L2* | **XS1N30PA349L2** *(9)* |
| *XS2N30PB340* | **XS1N30PB349** *(9)* |
| *XS2N30PB340D* | **XS1N30PB349D** *(9)* |
| *XS3P30NA340* | **XS530B1NAL2** *(4)* |
| *XS3P30NA340D* | **XS530B1NAM12** *(4)* |
| *XS3P30NA340L1* | **XS530B1NAL5** *(4)* |

| *Old sensor* | **New Osiprox sensor** |
|---|---|
| *XS3P30NA370* | **XS630B1NAL2** *(4)* |
| *XS3P30NA370L1* | **XS630B1NAL5** *(4)* |
| *XS3P30PA340* | **XS530B1PAL2** *(4)* |
| *XS3P30PA340D* | **XS530B1PAM12** *(4)* |
| *XS3P30PA340L1* | **XS530B1PAL5** *(4)* |
| *XS3P30PA340L2* | **XS530B1PAL10** *(4)* |
| *XS3P30PA370* | **XS630B1PAL2** *(4)* |
| *XS3P30PA370L1* | **XS630B1PAL5** *(4)* |
| *XS3P30PA370L2* | **XS630B1PAL10** *(4)* |

*(1) For the new sensor an integral M12 connector replaces the M12 connector on a 0.80 m flying lead.*
*(4) For the new Osiprox® sensor the metal case replaces the plastic case.*
*(5) For the new sensor, Sn = 15 mm instead of 20 mm.*
*(9) For the new sensor, Sn = 20 mm instead of 15 mm.*

| *Old sensor* | **New Osiprox sensor** |
|---|---|
| **Cylindrical type, a.c. supply** | |
| **Diameter 12 mm** | |
| *XS1M12FA264* | **XS112BLFAL2** |
| *XS1M12FA264L2* | **XS112BLFAL10** |
| *XS1M12MA230* | **XS612B1MAL2** |
| *XS1M12MA230K* | **XS612B1MAU20** |
| *XS1M12MA230L1* | **XS612B1MAL5** |
| *XS1M12MA230L2* | **XS612B1MAL10** |
| *XS1M12MA239* | **XS612B1MAL2** |
| *XS1M12MA239K* | **XS612B1MAU20** |
| *XS1M12MB230* | **XS612B1MBL2** |
| *XS1M12MB230K* | **XS612B1MBU20** |
| *XS1M12MB230L1* | **XS612B1MBL5** |
| *XS1M12MB230L2* | **XS612B1MBL10** |
| *XS2M12MA230* | **XS612B1MAL2** |
| *XS2M12MA230K* | **XS612B1MAU20** |
| *XS2M12MA230L1* | **XS612B1MAL5** |
| *XS2M12MA230L2* | **XS612B1MAL10** |
| *XS2M12MB230* | **XS612B1MBL2** |
| *XS2M12MB230K* | **XS612B1MBU20** |
| *XS2M12MB230L1* | **XS612B1MBL5** |
| *XS2M12MB230L2* | **XS612B1MBL10** |
| *XS3P12MA230* | **XS612B1MAL2** *(4)* |
| *XS3P12MA230K* | **XS612B1MAU20** *(4)* |
| *XS3P12MA230L1* | **XS612B1MAL5** *(4)* |
| *XS3P12MA230L2* | **XS612B1MAL10** *(4)* |
| *XS3P12MB230* | **XS612B1MBL2** *(4)* |
| *XS3P12MB230K* | **XS612B1MBU20** *(4)* |
| *XS3P12MB230L1* | **XS612B1MBL5** *(4)* |

| *Old sensor* | **New Osiprox sensor** |
|---|---|
| **Diameter 18 mm** | |
| *XS1M18FA264* | **XS118BLFAL2** |
| *XS1M18MA230* | **XS618B1MAL2** |
| *XS1M18MA230K* | **XS618B1MAU20** |
| *XS1M18MA230L1* | **XS618B1MAL5** |
| *XS1M18MA230L2* | **XS618B1MAL10** |
| *XS1M18MA239* | **XS618B1MAL2** *(7)* |
| *XS1M18MA239K* | **XS618B1MAU20** *(7)* |
| *XS1M18MB230* | **XS618B1MBL2** |
| *XS1M18MB230K* | **XS618B1MBU20** |
| *XS1M18MB230L1* | **XS618B1MBL5** |
| *XS1M18MB230L2* | **XS618B1MBL10** |
| *XS2M18MA230* | **XS618B1MAL2** |
| *XS2M18MA230K* | **XS618B1MAU20** |
| *XS2M18MA230L1* | **XS618B1MAL5** |
| *XS2M18MA230L2* | **XS618B1MAL10** |
| *XS2M18MB230* | **XS618B1MBL2** |
| *XS2M18MB230K* | **XS618B1MBU20** |
| *XS2M18MB230L1* | **XS618B1MBL5** |
| *XS2M18MB230L2* | **XS618B1MBL10** |
| *XS3P18MA230* | **XS618B1MAL2** *(4)* |
| *XS3P18MA230K* | **XS618B1MAU20** *(4)* |
| *XS3P18MA230L1* | **XS618B1MAL5** *(4)* |
| *XS3P18MA230L2* | **XS618B1MAL10** *(4)* |
| *XS3P18MB230* | **XS618B1MBL2** *(4)* |
| *XS3P18MB230A* | **XS618B1MBU20** *(4)* |
| *XS3P18MB230K* | **XS618B1MBU20** *(4)* |
| *XS3P18MB230L1* | **XS618B1MBL5** *(4)* |

| *Old sensor* | **New Osiprox sensor** |
|---|---|
| **Diameter 30 mm** | |
| *XS1M30FA264* | **XS130BLFAL2** |
| *XS1M30MA230* | **XS630B1MAL2** |
| *XS1M30MA230K* | **XS630B1MAU20** |
| *XS1M30MA230L1* | **XS630B1MAL5** |
| *XS1M30MA230L2* | **XS630B1MAL10** |
| *XS1M30MA239* | **XS630B1MAL2** *(5)* |
| *XS1M30MB230* | **XS630B1MBL2** |
| *XS1M30MB230K* | **XS630B1MBU20** |
| *XS1M30MB230L1* | **XS630B1MBL5** |
| *XS1M30MB230L2* | **XS630B1MBL10** |
| *XS2M30MA230* | **XS630B1MAL2** |
| *XS2M30MA230K* | **XS630B1MAU20** |
| *XS2M30MA230L1* | **XS630B1MAL5** |
| *XS2M30MA230L2* | **XS630B1MAL10** |
| *XS2M30MB230* | **XS630B1MBL2** |
| *XS2M30MB230K* | **XS630B1MBU20** |
| *XS2M30MB230L1* | **XS630B1MBL5** |
| *XS2M30MB230L2* | **XS630B1MBL10** |
| *XS3P30MA230* | **XS630B1MAL2** *(4)* |
| *XS3P30MA230K* | **XS630B1MAU20** *(4)* |
| *XS3P30MA230L1* | **XS630B1MAL5** *(4)* |
| *XS3P30MA230L2* | **XS630B1MAL10** *(4)* |
| *XS3P30MB230* | **XS630B1MBL2** *(4)* |
| *XS3P30MB230K* | **XS630B1MBU20** *(4)* |
| *XS3P30MB230L1* | **XS630B1MBL5** *(4)* |

*(4) For the new Osiprox® sensor the metal case replaces the plastic case.*
*(5) For the new sensor, Sn = 15 mm instead of 20 mm.*
*(7) For the new sensor, Sn = 8 mm instead of 10 mm.*