# Inductive proximity sensors
# XS range

## Catalogue

Simply easy!™

Telemecanique

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# Inductive proximity sensors
# XS range


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# Inductive proximity sensors

## XS range

## General purpose

### Cylindrical type

### Standard range

Flush mountable

| Sensing distance Sn (mm) | | 1.5 | 2 | 5 | 10 |
|---|---|---|---|---|---|
| Diameter | | Ø 6.5 plain and M8 | M12 | M18 | M30 |
| Short case | Supply | | | | |
| | 3-wire ⎓ (PNP/NPN) | Page 22 | | | |
| | 2-wire ⎓ | Page 26 | | | |
| Long case | Supply | | | | |
| | 3-wire ⎓ (PNP/NPN) | Page 23 | | | |
| | 2-wire ⎓ | Page 27 | | | |
| | 2-wire ∿ | – | Page 30 | | |
| Function | NO | ● | ● | ● | ● |
| | NC | ● | ● | ● | ● |
| Connection | Pre-cabled (L = 2 m) *(1)* | ● | ● | ● | ● |
| | M8 connector, 3-pin (3-wire ⎓) | ● | – | – | – |
| | M12 connector | ● | ● | ● | ● |
| | 1/2"-20UNF connector | – | ● | ● | ● |
| | Remote connector | Remote connectors available: M8, M12, M18, screw terminal, 7/8", DIN: please consult our Customer Care Centre | | | |
| Degree of protection | | IP 65 and IP 67, IP 68 for pre-cabled version, IP 69K for diameters 12 to 30 | | | |
| Special temperatures | - 40 °C, + 70 °C | Add the suffix TF to the end of the reference *(2)* | | | |
| | - 25 °C, + 85° C | Add the suffix TT to the end of the reference *(2)* | | | |
| Type reference | | XS506 | XS508 | XS512 | XS518 | XS530 |
| Pages | | 22 to 31 | | | |

*(1) Also available in lengths of 5 and 10 m, depending on model*
*(2) Product availability depending on model: please consult our Customer Care Centre.*

### Increased range

Flush mountable

| Sensing distance Sn (mm) | | 2.5 | 4 | 8 |
|---|---|---|---|---|
| Diameter | | Ø 6.5 plain and M8 | M12 | M18 |
| Short case | Supply | | | |
| | 3-wire ⎓ (PNP/NPN) | Pages 32 and 33 | | |
| | 2-wire ⎓ | Page 36 | | |
| Long case | Supply | | | |
| | 3-wire ⎓ (PNP/NPN) | Page 34 | | |
| | 2-wire ⎓ | Page 36 | | |
| | 2-wire ∿ | – | Page 38 | |
| Function | NO | ● | ● | ● |
| | NC | ● | ● | ● |
| Connection | Pre-cabled (L = 2 m) *(1)* | ● | ● | ● |
| | M8 connector, 3-pin (3-wire ⎓) | ● | – | – |
| | M12 connector | ● | ● | ● |
| | 1/2"-20UNF connector | – | ● | ● |
| | Remote connector | Remote connectors available: M8, M12, M18, screw terminal, 7/8", DIN: plea | | |
| Degree of protection | | IP 65 and IP 67, IP 68 for pre-cabled version, I diameters 12 to 30 | | |
| Special temperatures | - 40 °C, + 70 °C | Add the suffix TF to the end of the reference *(2* | | |
| | - 25 °C, + 85° C | Add the suffix TT to the end of the reference *(2* | | |
| Type reference | | XS106<br>XS606<br><br>XS108<br>XS608 | XS112<br>XS612 | XS118<br>XS618 |
| Pages | | 32 to 39 | | |

# Inductive proximity sensors

## XS range

## General purpose

| Block type | | Standard range<br>Flush mountable | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **Sensing distance Sn** (mm) | | **2.5** | **5** | **10** | **15** | **40** |
| **Dimensions** (W x H x D) | | **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** |
| **Supply** | 3-wire ⎓ (PNP/NPN) | Page 46 | Page 46 | Page 48 | Page 48 | Page 48 |
| | 2-wire ⎓ | Page 46 | Page 46 | Page 48 | Page 48 | Page 48 |
| | ∿ | – | – | – | – | – |
| **Function** | NO | ● | ● | ● | ● | ● |
| | NC | ● | ● | ● | ● | ● |
| | NO + NC | – | – | – | – | – |
| | NO/NC | – | – | – | – | – |
| **Connection** | Pre-cabled (L = 2 m) *(1)* | ● | ● | ● | ● | ● |
| | M8 connector, 3-pin (3-wire ⎓) | – | – | ● | ● | – |
| | M12 connector | – | – | – | – | ● |
| | 1/2"-20UNF connector | – | – | – | – | – |
| | Screw terminals | – | – | – | – | – |
| | Remote connector M8 | ● | ● | – | – | – |
| | Remote connector M12 | – | – | ● | ● | – |
| | Remote connector 1/2"-20 UNF | – | – | – | – | – |
| | Other remote connectors available | M18, screw terminal, 7/8", DIN: please consult our Customer Care Centre | | | | |
| **Degree of protection** | | IP 67 | IP 67, double insulation ⧈<br>or IP 68, double insulation ⧈, depending on model | | | |
| **Special temperatures** | - 40 °C, + 70 °C | Add the suffix TF to the end of the reference *(2)* | | | | |
| | - 25 °C, + 85 °C | Add the suffix TT to the end of the reference *(2)* | | | | |
| **Type reference** | | **XS7J** | **XS7F** | **XS7E** | **XS7C** | **XS7D** |
| **Pages** | | 46 | | 48 | | |

*(1) Also available in lengths of 5 and 10 m, depending on model.*
*(2) Product availability depending on model: please consult our Customer Care Centre.*

| Standard and increased ranges<br>Flush mountable | |
|---|---|
| | |
| **15** | |
| **40 x 40 x 70** and **40 x 40 x 117** | |
| Pages 50 and 52 | |
| Pages 50 and 52 | |
| Pages 50 and 52 | |
| ● | |
| ● | |
| – | |
| ● | |
| – | |
| – | |
| ● | |
| ● | |
| ● | |
| – | |
| – | |
| – | |
| – | |
| IP 65, IP 67 and IP 69K | |
| Add the suffix TF to the end of the reference (2 | |
| Add the suffix TT to the end of the reference (2 | |
| **XS7C2, XS7C4, XS8C2 and XS8C4** | |
| 50 and 52 | |

# Inductive proximity sensors

## XS range

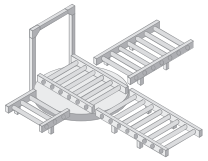
## General purpose

| Sensor type: flush and non flush mountable | | Multivoltage sensors | Sensors with 2 complementary outputs | |
|---|---|---|---|---|
| | | With short-circuit protection | Solid-state PNP or NPN NO + NC outputs | Solid-state PNP + NPN, NO or NC programmable outputs |
| | | | | |
| **Sensing distance Sn** (mm) | Flush mountable | **2 ... 10** | **1.5 ... 15** | **2 ... 10** |
| | Non flush mountable | **4 ... 15** | **2.5 ...15** | **4 ... 15** |
| **Diameter** | | Threaded: M12, M18, M30 | Plain: Ø 6.5<br>Threaded: M8, M12, M18, M30 | Threaded: M12, M18, M30 |
| **Case material** | | Nickel plated brass | Nickel plated brass or stainless steel or plastic | Nickel plated brass or plastic |
| **Supply** | ⎓ | – | ● | ● |
| | ~ | – | – | – |
| | ≂ | ● | – | – |
| **Function** | NO | ● | – | – |
| | NC | ● | – | – |
| | NO + NC | – | ● | – |
| | NO/NC | – | – | ● programmable |
| **Connection** | Pre-cabled (L = 2 m) *(1)* | ● | ● | ● |
| | M8 connector, 3-pin (3-wire ⎓) | – | – | – |
| | M12 connector | – | ● | ● |
| | 1/2"-20UNF connector | ● | – | – |
| | Remote connector | Remote connectors available:<br>M8, M12, M18, screw terminal, 7/8", DIN: please consult our Customer Care Centre | | |
| **Degree of protection** | | IP 67, IP 68 or IP 69K depending on model | | |
| **Special temperatures** | - 40 °C, + 70 °C | Add the suffix TF to the end of the reference *(2)* | | |
| | - 25 °C, + 85 °C | Add the suffix TT to the end of the reference *(2)* | | |
| **Type reference** | | **XS1M**<br>**XS2M** | **XS1●●●●C410**<br>**XS4P●●●C410**<br>**XS1●●B3PC●** | **XS1M●●KP340**<br>**XS2M●●KP340**<br>**XS4P●●KP340** |
| **Pages** | | 54 | 56 and 60 | 62 |

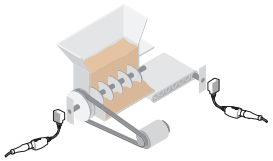
| Plastic case sensors | Bas |
|---|---|
| For chemical processing, marine applications | For |
| | |
| – | 1.5 . |
| **2.5 ... 15** | **2.5 .** |
| Threaded: M8, M12, M18, M30 | Threa M18, |
| Plastic | Nicke |
| ● | ● |
| – | – |
| ● | – |
| – | ● |
| ● | ● |
| – | – |
| – | – |
| ● | ● |
| – | ● |
| – | ● |
| ● | – |
| Remote connectors available:<br>M8, M12, M18, screw terminal, 7/8", DIN: plea | |
| IP 67 or IP 68 depending on model | IP 67 |
| Add the suffix TF to the end of the reference (2 | |
| Add the suffix TT to the end of the reference (2 | |
| **XS4P** | **XS1●**<br>**XS2●** |
| 64 | Pleas |

# Inductive proximity sensors
XS range
Applications

## Applications



*Conveying*



*Detection of underspeed, shaft overload*

*Position,*

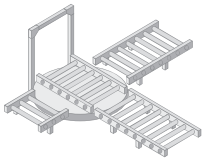
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sensor type: flush and non flush mountable** | | **Adjustable range sensors** | | | | **Sensors for rotation monitoring** | | **Sensors 0 ... 10 V** |
| **Developed in accordance with the needs expressed by our customers, these sensors provide a complete solution for specific application functions: rotation monitoring, selective detection, analogue control, etc.** | | | | | | | | |
| **Sensing dist. Sn (mm)** | Flush mountable | **3...11** *(1)* | **15** | **25** | **60** | **10** | **10…15** *(1)* | **0.2…10** |
| | Non flush mountable | **5...18** *(1)* | – | – | – | **10** | **10…15** *(1)* | **0.4…15** |
| **Form** | **Cylindrical** | M12 x 54<br>M18 x 67<br>M30 x 71 | – | – | – | M30 x 81 | – | Threade<br>M18, M3 |
| | **Block (W x H x D) dimensions in mm** | – | 26 x 26 x 13 | 40 x 40 x15 | 80 x 80 x 26 | – | 26 x 26 x 13<br>40 x 40 x 15 | – |
| **Case material** | | Nickel plated brass | PBT | PBT | PBT | Metal | PBT | Metal or |
| **Supply** | ⎓ | ● | ● | ● | ● | ● | ● | ● |
| | ~ | – | – | – | – | – | – | – |
| | ≂ | – | ● | ● | ● | ● | ● | – |
| **Function** | NO | ● | ● | ● | ● | – | – | – |
| | NC | ● | ● | ● | ● | ● | ● | – |
| | NO + NC | – | – | – | – | – | – | – |
| | NO/NC | – | – | – | – | – | – | – |
| **Connection** | Pre-cabled (L = 2 m) *(2)* | – | ● | ● | ● | ● | – | ● |
| | M8 connector, 3-pin (⎓ 3-wire) | – | ● | ● | – | – | – | – |

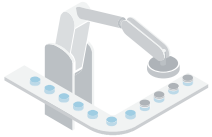
# Inductive proximity sensors

XS range

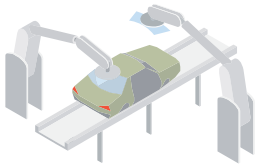
Applications

## Applications





*Conveying*



*Robotics*

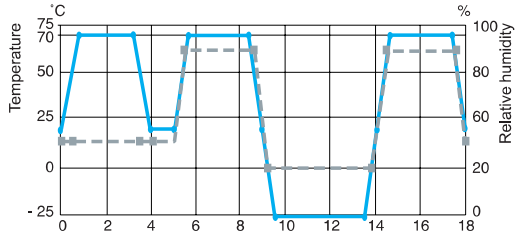
*Asser*

| Sensor type: flush and non flush mountable | Sensors for conveying and material handling applications | | | Sensors for welding machine applications | Facto |
|---|---|---|---|---|---|
| | Cylindrical, stainless steel 303 | 12 x 40 x 26 format | 80 x 80 x 40 format, increased range | Cylindrical, stainless steel 303 | Cylin |
| 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. | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sensing dist. Sn (mm)** | Flush mountable | **3, 6, 10 or 20** *(1)* | **2** | **50** | **6 or 10** *(1)* | **5, 10** |
| | Non flush mountable | **6, 10, 20 or 40** *(1)* | **4** | **42** | **–** | **–** |
| **Form** | **Cylindrical** | Threaded: M8, M12, M18, M30 | – | – | Threaded: M12, M18 | Threa |
| | **Block (W x H x D) dimensions in mm** | – | 12 x 40 x 26 | 80 x 80 x 40 | – | – |
| **Case material** | | Stainless steel 303 | Plastic | Plastic | Stainless steel 303 | Metal |
| **Supply** | ⎓ | ● | ● | ● | ● | ● |
| | ∼ | – | – | – | – | – |
| | ≂ | – | ● | – | – | – |
| **Function** | NO | ● | ● | ● | ● | – |
| | NC | – | ● | – | – | – |
| | NO + NC | – | ● | – | – | – |
| | NO/NC | – | – | – | – | ● |
| **Connection** | Pre-cabled (L = 2 m) *(2)* | – | ● | – | – | ● |
| | M8 connector, 3-pin (⎓ 3-wire) | – | ● | – | – | – |
| | M12 connector | ● | – | ● | ● | ● |

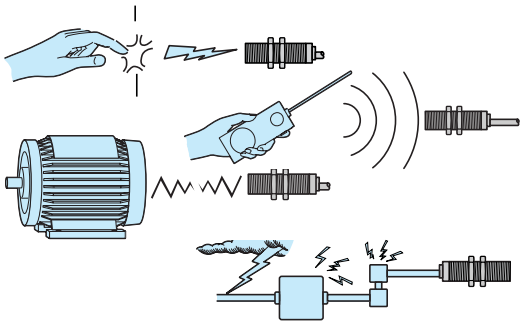
# Inductive proximity sensors
XS range

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




- 25° + 70 °C cycle, 95 % RH

*Temperature °C*
*Humiditv 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 consult our website: www.tesensors.com

### 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 Telemecanique Sensors 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.
  Telemecanique Sensors with an IP 68 degree of protection are ideal for use in the most arduous conditions, such as machine tools, automatic car washers.
- **IP 69K**: protection against the effects of high pressure cleaning. Adherence to standard DIN 40050 which stipulates that the product must withstand a water jet at a pressure of 90 bar and temperature of +80 °C for 3 minutes.
  No deterioration in either operating or insulation characteristics is permitted.

### 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.).

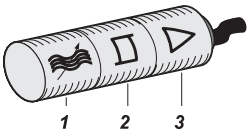
In all cases, the materials selected (see product characteristics) provide satisfactory compatibility in most industrial environments (for further information, please consult our Customer Care Centre).

### Class 2 devices ⧈

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

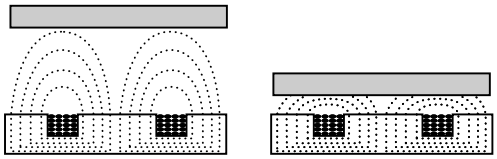
# Inductive proximity sensors
XS range

## 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.

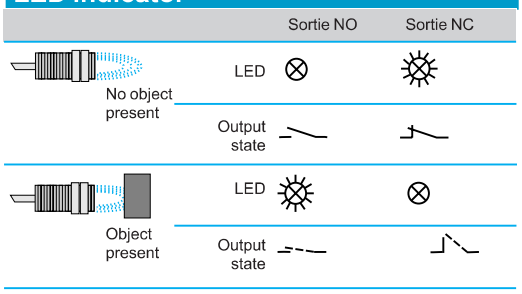
### Advantages of inductive detection

■ 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.

### Flush mountable using teach mode sensors

■ The flush mountable sensors using teach mode 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 70.

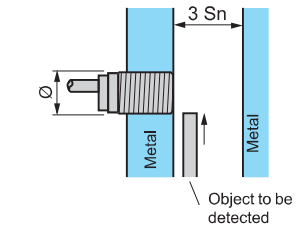
## LED indicator

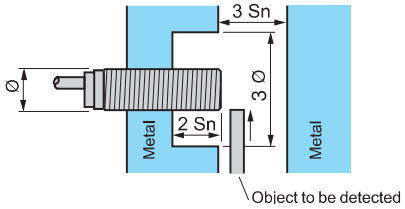



### Output LED

All Telemecanique Sensors inductive proximity sensors incorporate an output state LED indicator.
The flush mountable sensors using teach mode 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




### Flush mountable in metal

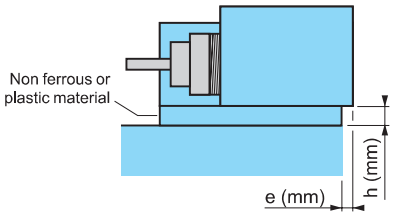
■ No side clearance required.
■ All flush mountable sensors using teach mode also enable detection of an object against a metal background. For further information, see pages 70 and 71.

### Sensors not suitable for flush mounting in metal

■ Side clearance required.
Sensing distance greater than that for a standard flush mountable model.
■ Flush mountable sensors using teach mode eliminate the need for side clearance. For further information, see pages 70 and 71.

# Inductive proximity sensors
XS range

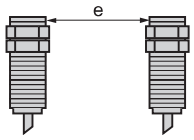
## Mounting sensors on a metal support



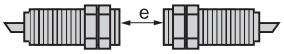

### Mounting using fixing clamp

- ■ 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.
- ■ Flush mountable sensors using teach mode: e = 0, h = 0

## Mounting distance between sensors




*Mounting side by side*
*e ⩾ 2 Sn*




*Mounting face to face*
*e ⩾ 10 Sn*

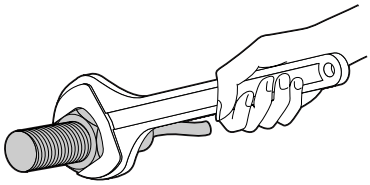
### Standard sensors

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, the 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 our Customer Care Centre.
In this case, a staggered frequency sensor is mounted adjacent to or opposite each standard sensor.

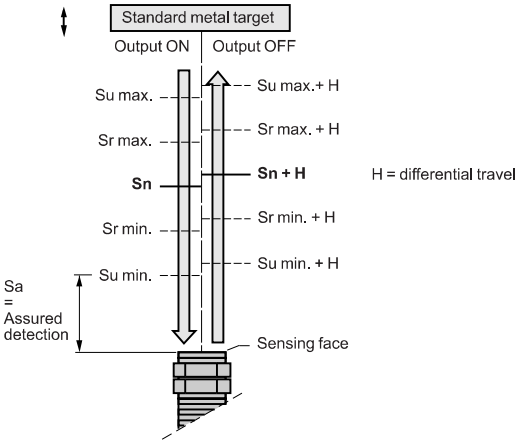
## Tightening torque for cylindrical type sensors

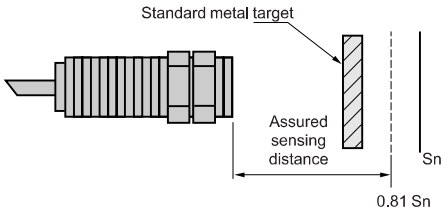


| | Maximum tightening torque for the various sensor case materials | | | | | |
|---|---|---|---|---|---|---|
| | Brass | | Stainless steel | | Plastic | |
| | XS1●●B●<br>XS2●●B●<br>XS5●●B●<br>XS6●●B●<br>XSAV● | | XS1●●<br>XS2●●<br>XS5●●B●<br>XS6●●B●<br>XS9●●R/S | | XS2●●AA<br>XS4P● | |
| Diameter of sensor | Maximum tightening torque | | | | | |
| mm | N.m | lb-in | N.m | lb-in | N.m | lb-in |
| **Ø 5** | 1.6 | 14.16 | 2 | 17.70 | – | – |
| **Ø 8** | 5 | 44.25 | 9 | 79.65 | 1 | 8.85 |
| **Ø 12** | 6 | 53.10 | 30 | 265.52 | 2 | 17.70 |
| **Ø 18** | 15 | 132.76 | 50 | 442.54 | 5 | 44.25 |
| **Ø 30** | 40 | 354.03 | 100 | 885.07 | 20 | 177.01 |

# Inductive proximity sensors
XS range

## Sensing distance




### Definitions

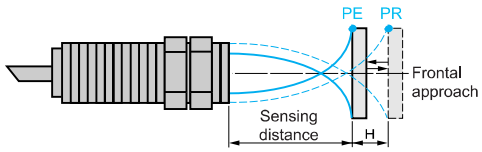
In order to ensure that customers can make reliable product comparisons and selection, the standard IEC 60947-5-2 defines various sensing distances, such as:

- **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).
- **Effective sensing distance (Sr)**
  The effective 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 ⩽ Sr ⩽ 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 effective sensing distance: 0.9 Sr ⩽ Su ⩽ 1.1 Sr.
- **Assured operating distance (Sa).**
  This is the operating zone of the sensor. The assured sensing distance is between 0 and 81% of the nominal sensing distance (Sn): 0 ⩽ Sa ⩽ 0.9 x 0.9 x 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).

## Terminology



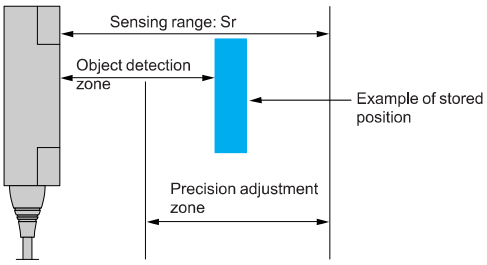

PE = pick-up point, the object is detected
PR = drop-out point, the object is no longer detected

### Differential travel

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

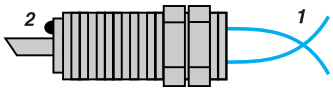
### Repeat accuracy

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 the effective sensing distance Sr.
For all XS sensors, the repeat accuracy is 3 %.




### Detection zone and precision adjustment zone

- Flush mountable sensors using teach mode, due to adjustment of sensitivity whilst teaching, 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.




*1 Detection threshold curves*
*2 “Object detected” LED*

### 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.

# Inductive proximity sensors
XS range

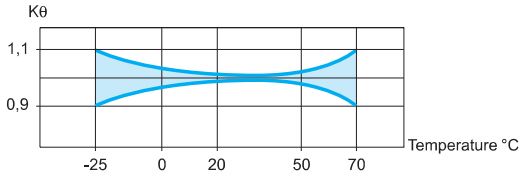
## Correction coefficients to apply to the assured operating distance

### 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.

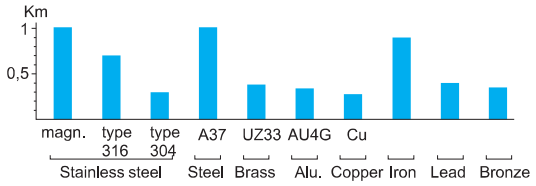
For the calculation of the assured operating distance for different operating conditions, one must take into account the correction coefficients that influence it.

*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

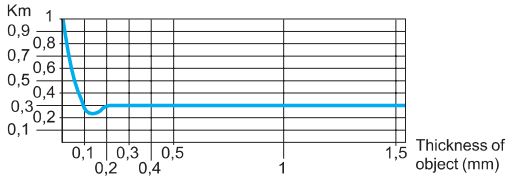
Apply a correction coefficient Kq, determined from the curve shown opposite.




### Material of object to be detected

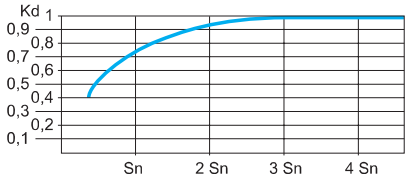
Apply a correction coefficient Km, determined from the diagram shown opposite.

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 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 sensing 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

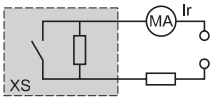
Application characteristics:
- object material and size: iron (Km = 0.9), 30 x 30 mm,
- temperature: 0 to 20 °C (Kθ = 0.98),
- object detection distance: 3 mm ± 1.5 mm, i.e. Sa max. = 4.5 mm,
- assume Kd = 1.

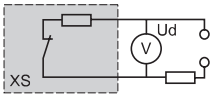
A sensor must be selected for which $\mathbf{Sn \geqslant \frac{Sa}{Kq \times Km \times Kd \times Kt} = \frac{4.5}{0.98 \times 0.9 \times 1 \times 0.9}}$

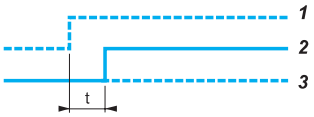
i.e. **Sn ⩾ 5.7 mm**

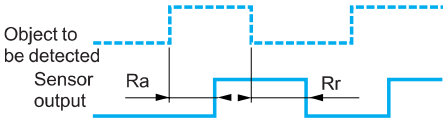
# Inductive proximity sensors
XS range

## 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*

■ Response time
□ 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.

## Supply

### Sensors for AC circuits (∿ and ≂ models)

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

### Sensors for DC circuits

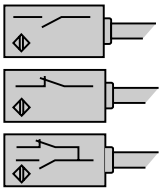
■ **DC source:** check that the voltage limits of the sensor and the acceptable level of ripple are compatible with the supply used.

■ **AC 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 AC supply, the voltage must be rectified and smoothed to ensure that:
- the peak voltage of the DC 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 DC voltage (U).

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

## Outputs



### Output signal (contact logic)

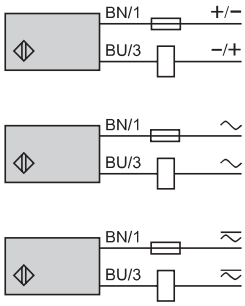
■ Normally open (NO)
Corresponds to a sensor whose output changes to the closed state when an object is present in the operating zone.

■ 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.

# Inductive proximity sensors
XS range

## Outputs (continued)

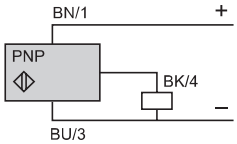



### 2-wire ⎓ type, non polarised NO or NC output

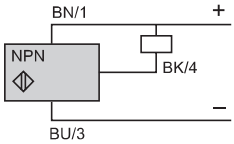
■ **Specific aspects**
These sensors are wired in series with the load to be switched.
As a consequence, they are subject to:
- a residual current in the open state (current flowing through the sensor in the "open" state),
- A voltage drop in the closed state (voltage drop across the sensor's terminals 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 (AC or AC/DC symbol), it is essential to connect a 0.4 A "quick-blow" fuse in series with the load.




***NO output***

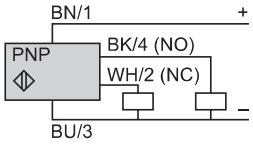


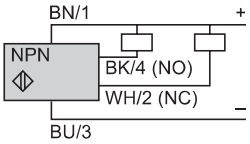

***NO output***

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

■ **Specific aspects**
- These sensors comprise 2 wires for the DC 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.

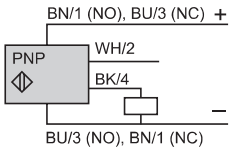
■ **Advantages**
- Protection against supply reverse polarity,
- Protection against overload and short-circuit,
- No residual current, low voltage drop.

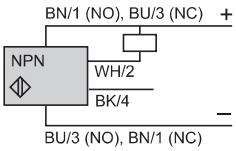



### 4-wire ⎓ type, complementary NO and NC outputs, PNP or NPN

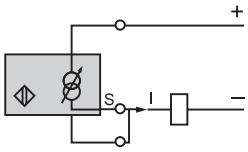
■ **Advantages**
- Protection against supply reverse polarity (+/-).
- Protection against overload and short-circuit.



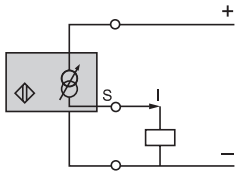




### 4-wire ⎓ type, multifunction, programmable NO or NC output, PNP or NPN

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




***2-wire connection***



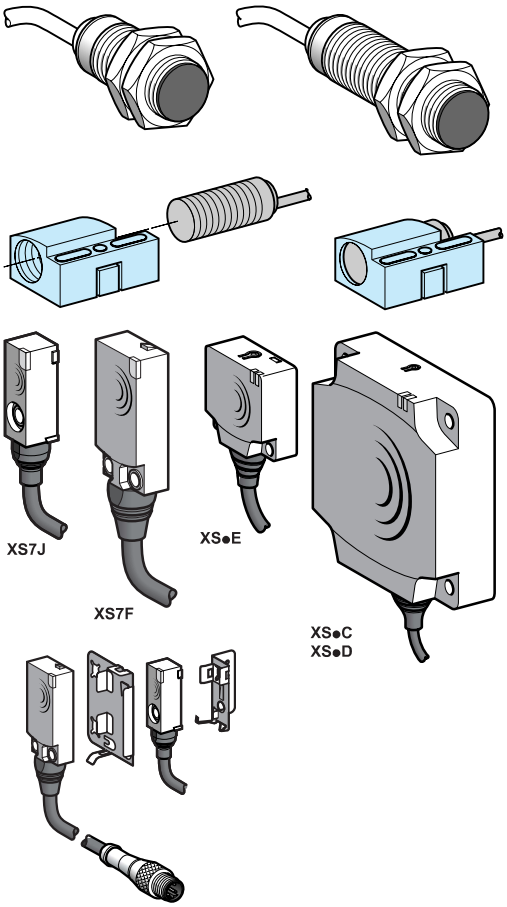

***3-wire connection***

### 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
XS range

## Features of the various models




### Types of case

■ **Cylindrical case**
- □ Fast installation and setting-up.
- □ Short case and long case, 2-wire ⎓ and 3-wire ⎓ versions available.
- □ Pre-cabled (moulded cable) and various integral connector (M8, M12, 7/8", M18) and remote connector (on flying lead) versions available.
- □ Small size facilitates mounting in locations with restricted access.
- □ **Interchangeability**, provided by indexed **fixing clamp**: when assembled, becomes similar to a block type sensor.

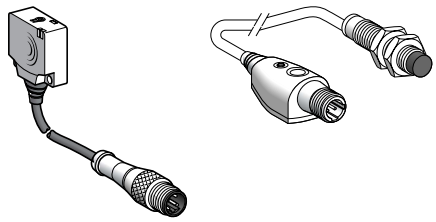
■ **Flat case**
- □ Reduced size (sensor volume divided by 8).
- □ Fast installation by mounting on clip-on brackets.
- □ Precision detection with the flush mountable sensors using teach mode (see page 70).

## Electrical connection

1

2

3



### 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).

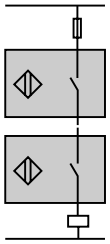
### Wiring advice

■ **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.**

## Setting-up precautions



### Connection in series

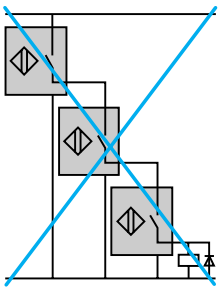
#### 2-wire type sensors

- 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.

$$U\ \text{sensor} = \frac{\textbf{U (supply)}}{\textbf{n sensors}}$$

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

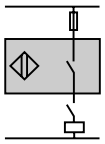
- If only one sensor in the circuit is in the open state, it will be supplied at a voltage almost equal to the supply voltage.
- When in the closed state, a small voltage drop is present across each sensor. The resultant loss of voltage at the load will be the sum of the individual voltage drops and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

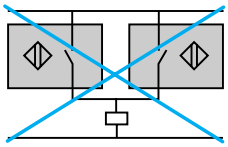
- The following points should be taken into account:
  - When the mechanical contact is open, the sensor is not supplied.
  - When the contact closes, the sensor does not operate until a certain time (t) has elapsed (corresponding to the first-up delay).

### Connection in parallel

#### 2-wire type sensors

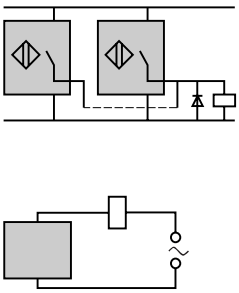
**This connection method is not recommended.**

- 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.



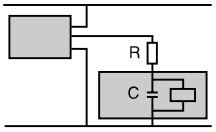
#### 3-wire type sensors

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



### AC supply

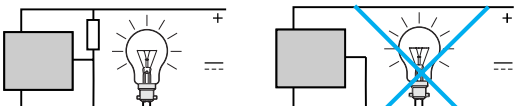
- **2-wire type sensors cannot be connected directly to an AC supply.**
  - This would result in immediate destruction of the sensor and considerable danger to the user.
  - An appropriate load (refer to the instruction sheet supplied with the sensor) must always be connected in series with the sensor.




### 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.

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




### 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.

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

## Fast trouble shooting guide

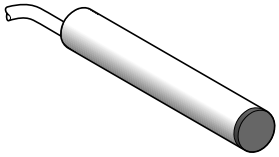
| Problem | Possible causes | Remedy |
|---|---|---|
| **The sensor's output will not change state when a metal object enters the detection zone** | On a flush mountable sensor using teach mode:<br>setting-up or programming error. | ■ After a RESET, follow the environment teach mode procedure. Refer 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 flush mountable sensor using teach mode:<br>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. |
| | Sensing 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 DC supplies, when derived from rectified AC, are correctly smoothed (C > 400 µF).<br>■ Separate AC power cables from low-level DC 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

## XS range, general purpose

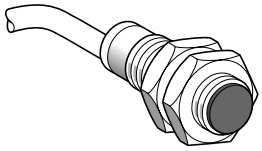
Cylindrical, standard range, flush mountable
Three-wire DC, solid-state output

801120



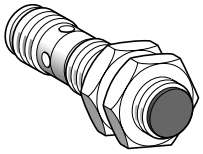
XS506B1●●L2

801231



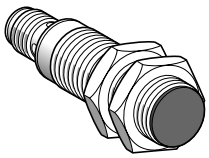
XS508B1●●L2

801232



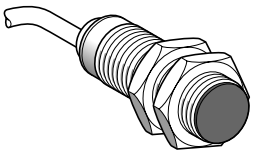
XS512B1●●M12

821938



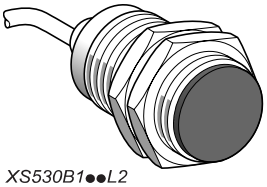
XS518B1●●M12

821936



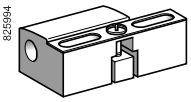
XS518B1●●●L2

DF535158



XS530B1●●L2

825994



XSZB1●●

### Sensors, 3-wire ⎓ 12-24 V, short case model

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Ø 6.5, plain** | | | | | |
| **1.5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS506B1PAL2** | 0.035 |
| | | | M8 connector | **XS506B1PAM8** | 0.025 |
| | | | M12 connector | **XS506B1PAM12** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS506B1NAL2** | 0.035 |
| | | | M8 connector | **XS506B1NAM8** | 0.025 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS506B1PBL2** | 0.035 |
| | | | M8 connector | **XS506B1PBM8** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS506B1NBL2** | 0.035 |
| | | | M8 connector | **XS506B1NBM8** | 0.025 |
| **Ø 8, threaded M8 x 1** | | | | | |
| **1.5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS508B1PAL2** | 0.035 |
| | | | M8 connector | **XS508B1PAM8** | 0.025 |
| | | | M12 connector | **XS508B1PAM12** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS508B1NAL2** | 0.035 |
| | | | M8 connector | **XS508B1NAM8** | 0.025 |
| | | | M12 connector | **XS508B1NAM12** | 0.025 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS508B1PBL2** | 0.035 |
| | | | M8 connector | **XS508B1PBM8** | 0.025 |
| | | | M12 connector | **XS508B1PBM12** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS508B1NBL2** | 0.035 |
| | | | M8 connector | **XS508B1NBM8** | 0.025 |
| | | | M12 connector | **XS508B1NBM12** | 0.025 |
| **Ø 12, threaded M12 x 1** | | | | | |
| **2** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS512B1PAL2** | 0.075 |
| | | | M12 connector | **XS512B1PAM12** | 0.035 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS512B1NAL2** | 0.075 |
| | | | M12 connector | **XS512B1NAM12** | 0.035 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS512B1PBL2** | 0.075 |
| | | | M12 connector | **XS512B1PBM12** | 0.035 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS512B1NBL2** | 0.075 |
| | | | M12 connector | **XS512B1NBM12** | 0.035 |
| **Ø 18, threaded M18 x 1** | | | | | |
| **5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS518B1PAL2** | 0.120 |
| | | | M12 connector | **XS518B1PAM12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS518B1NAL2** | 0.120 |
| | | | M12 connector | **XS518B1NAM12** | 0.060 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS518B1PBL2** | 0.120 |
| | | | M12 connector | **XS518B1PBM12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS518B1NBL2** | 0.120 |
| | | | M12 connector | **XS518B1NBM12** | 0.060 |
| **Ø 30, threaded M30 x 1.5** | | | | | |
| **10** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS530B1PAL2** | 0.205 |
| | | | M12 connector | **XS530B1PAM12** | 0.145 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS530B1NAL2** | 0.205 |
| | | | M12 connector | **XS530B1NAM12** | 0.145 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS530B1PBL2** | 0.205 |
| | | | M12 connector | **XS530B1PBM12** | 0.145 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS530B1NBL2** | 0.205 |
| | | | M12 connector | **XS530B1NBM12** | 0.145 |

### Accessories *(2)*

| Description | For use with sensors | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 6.5 (plain) | **XSZB165** | 0.005 |
| | Ø 8 | **XSZB108** | 0.006 |
| | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

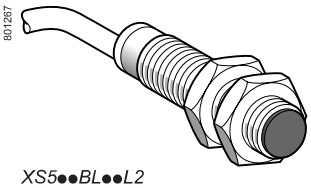
*(1) For a 5 m cable replace L2 by **L5**; for a 10 m cable replace L2 by **L10**. Please consult our Customer Care Centre for availability.*
*Example: **XS508B1PAL2** becomes **XS508B1PAL5** with a 5 m cable.*

*(2) For more information, see page 118*

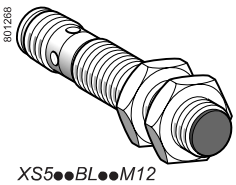
# Inductive proximity sensors

## XS range, general purpose

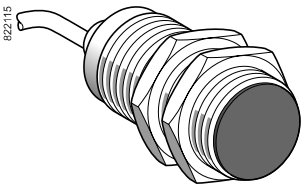
Cylindrical, standard range, flush mountable
Three-wire DC, solid-state output




*XS5●●BL●●L2*




*XS5●●BL●●M12*




*XS530BL●●L2*

### Sensors, 3-wire ⎓ 12-48 V, long case model

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Ø 8, threaded M8 x 1** | | | | | |
| **1.5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS508BLPAL2** | 0.035 |
| | | | M12 connector | **XS508BLPAM12** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS508BLNAL2** | 0.035 |
| | | | M12 connector | **XS508BLNAM12** | 0.025 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS508BLPBL2** | 0.035 |
| | | | M12 connector | **XS508BLPBM12** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS508BLNBL2** | 0.035 |
| | | | M12 connector | **XS508BLNBM12** | 0.025 |
| **Ø 12, threaded M12 x 1** | | | | | |
| **2** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS512BLPAL2** | 0.075 |
| | | | M12 connector | **XS512BLPAM12** | 0.035 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS512BLNAL2** | 0.075 |
| | | | M12 connector | **XS512BLNAM12** | 0.035 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS512BLPBL2** | 0.075 |
| | | | M12 connector | **XS512BLPBM12** | 0.035 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS512BLNBL2** | 0.075 |
| | | | M12 connector | **XS512BLNBM12** | 0.035 |
| **Ø 18, threaded M18 x 1** | | | | | |
| **5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS518BLPAL2** | 0.120 |
| | | | M12 connector | **XS518BLPAM12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS518BLNAL2** | 0.120 |
| | | | M12 connector | **XS518BLNAM12** | 0.060 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS518BLPBL2** | 0.120 |
| | | | M12 connector | **XS518BLPBM12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS518BLNBL2** | 0.120 |
| | | | M12 connector | **XS518BLNBM12** | 0.060 |
| **Ø 30, threaded M30 x 1.5** | | | | | |
| **10** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS530BLPAL2** | 0.205 |
| | | | M12 connector | **XS530BLPAM12** | 0.145 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS530BLNAL2** | 0.205 |
| | | | M12 connector | **XS530BLNAM12** | 0.145 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS530BLPBL2** | 0.205 |
| | | | M12 connector | **XS530BLPBM12** | 0.145 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS530BLNBL2** | 0.205 |
| | | | M12 connector | **XS530BLNBM12** | 0.145 |

### Accessories *(2)*

| Description | For use with sensors | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 6.5 (plain) | **XSZB165** | 0.005 |
| | Ø 8 | **XSZB108** | 0.006 |
| | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

*(1) For a 5 m cable replace L2 by **L5**; for a 10 m cable replace L2 by **L10**. Please consult our Customer Care Centre for availability.*
*Example: **XS508BLPAL2** becomes **XS508BLPAL5** with a 5 m cable.*

*(2) For more information, see page 118.*

# Inductive proximity sensors

## XS range, general purpose

Cylindrical, standard range, flush mountable
Three-wire DC, solid-state output

## Characteristics

| Sensor type | | | XS5●●B1●●M8, XS5●●B1●●M12<br>XS5●●BL●●M8, XS5●●BL●●M12 | XS5●●B1●●L2<br>XS5●●BL●●L2 |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE, E2 | |
| **Connection** | Connector | | M8 on Ø 6.5 and Ø 8,<br>M12 on Ø 8, Ø 12, Ø 18 and Ø 30 | – |
| | Pre-cabled | | – | Length: 2 m |
| **Operating zone** | Ø 6.5 and 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 effective sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 65 and IP 67 | IP 65 and IP 68, double insulation ⧈<br>(except Ø 6.5 and Ø 8: IP 67) |
| | Conforming to DIN 40050 | | IP 69K for Ø 12 to Ø 30 | |
| **Storage temperature** | | **°C** | -40…+85 | |
| **Operating temperature** | | **°C** | -25…+70 | |
| **Materials** | Case | | Nickel plated brass (except XS506 and XS508: stainless steel, grade 303) | |
| | Sensing face | | PPS | |
| | Cable | | – | PvR 3 x 0.34 $mm^2$ except **XS506** and **XS508**: 3 x 0.11 $mm^2$ |
| **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** | | | Yellow LED: 4 viewing ports at 90° | Yellow LED: annular |
| **Rated supply voltage** | | **V** | ⎓ 12…48 for XS5●●BL<br>⎓ 12…24 for XS5●●B1<br>with protection against reverse polarity | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…58 for XS5●●BL<br>⎓ 10…36 for XS5●●B1 | |
| **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** | **XS506, XS508, XS512** | **Hz** | 5000 | |
| | **XS518** | **Hz** | 2000 | |
| | **XS530** | **Hz** | 1000 | |
| **Delays** | First-up | **ms** | ⩽ 10 | |
| | Response | **ms** | ⩽ 0.1: **XS506, XS508** and **XS512**<br>⩽ 0.15: **XS518**<br>⩽ 0.3: **XS530** | |
| | Recovery | **ms** | ⩽ 0.1: **XS506, XS508** and **XS512**<br>⩽ 0.35: **XS518**<br>⩽ 0.7: **XS530** | |

# Inductive proximity sensors

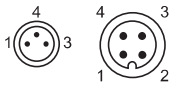
## XS range, general purpose

Cylindrical, standard range, flush mountable
Three-wire DC, solid-state output

## Wiring schemes

### Connector

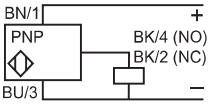
**M8** **M12**



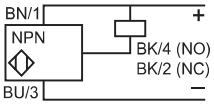

### Pre-cabled

BU: Blue
BN: Brown
BK: Black

### PNP



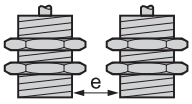

### NPN

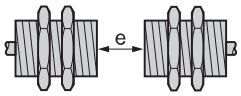


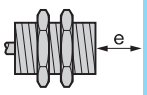

*For M8 connector, NO and NC outputs on terminal 4*

## Setting-up

### Minimum mounting distances (mm)

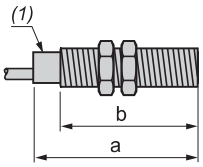



| Flush mountable sensors | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 6.5 | e ⩾ 3 | e ⩾ 18 | e ⩾ 4.5 |
| Ø 8 | e ⩾ 3 | e ⩾ 18 | e ⩾ 4.5 |
| Ø 12 | e ⩾ 4 | e ⩾ 24 | e ⩾ 6 |
| Ø 18 | e ⩾ 10 | e ⩾ 60 | e ⩾ 15 |
| Ø 30 | e ⩾ 20 | e ⩾ 120 | e ⩾ 30 |

## Dimensions




*(1) LED*

| Sensors | | Pre-cabled (mm) | | M8 connector (mm) | | M12 connector (mm) | |
|---|---|---|---|---|---|---|---|
| **Short case model** | | **a** | **b** | **a** | **b** | **a** | **b** |
| Ø 6.5 | **XS506B1** | 34 | – | 42 | – | 45 | – |
| Ø 8 | **XS508B1** | 34 | 25 | 42 | 27 | 45 | 23 |
| Ø 12 | **XS512B1** | 37 | 25 | – | – | 50 | 30 |
| Ø 18 | **XS518B1** | 39 | 28 | – | – | 50 | 28 |
| Ø 30 | **XS530B1** | 43 | 32 | – | – | 54 | 32 |

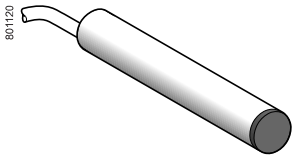
| Sensors | | Pre-cabled (mm) | | M12 connector (mm) | |
|---|---|---|---|---|---|
| **Long case model** | | **a** | **b** | **a** | **b** |
| Ø 8 | **XS508BL** | 51 | 42 | 61 | 40 |
| Ø 12 | **XS512BL** | 53 | 42 | 61 | 42 |
| Ø 18 | **XS518BL** | 62 | 52 | 74 | 52 |
| Ø 30 | **XS530BL** | 62 | 52 | 74 | 52 |

# Inductive proximity sensors

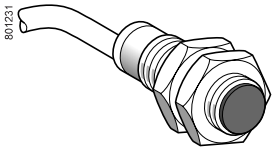
## XS range, general purpose

Cylindrical, standard range, flush mountable

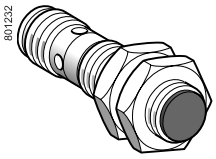
Two-wire DC



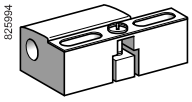

*XS506BS●●L2*




*XS512BS●●L2*




*XS5●●BS●●M12*




*XSZB1●●*

## Sensors, 2-wire ⎓ 12-24 V, short case model

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **Ø 6.5, plain** | | | | |
| **1.5** | NO terminals 1 & 4 *(2)* | Pre-cabled (L = 2 m) *(1)* | **XS506BSCAL2** | 0.035 |
| | | Remote M12 connector | **XS506BSCAL01M12** | 0.050 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS506BSCBL2** | 0.035 |
| **Ø 8, threaded M8 x 1** | | | | |
| **1.5** | NO terminals 1 & 4 *(2)* | Pre-cabled (L = 2 m) *(1)* | **XS508BSCAL2** | 0.035 |
| | | Remote M12 connector | **XS508BSCAL01M12** | 0.050 |
| | | Remote M12 connector | **XS508BSCAL08M12** | 0.050 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS508BSCBL2** | 0.035 |
| | | Remote M12 connector | **XS508BSCBL01M12** | 0.050 |
| **Ø 12, threaded M12 x 1** | | | | |
| **2** | NO | Pre-cabled (L = 2 m) *(1)* | **XS512BSDAL2** | 0.075 |
| | | M12 connector | **XS512BSDAM12** | 0.035 |
| | NO terminals 1 & 4 *(2)* | M12 connector | **XS512BSCAM12** | 0.035 |
| | | Remote M12 connector | **XS512BSCAL08M12** | 0.060 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS512BSDBL2** | 0.075 |
| | | M12 connector | **XS512BSDBM12** | 0.035 |
| **Ø 18, threaded M18 x 1** | | | | |
| **5** | NO | Pre-cabled (L = 2 m) *(1)* | **XS518BSDAL2** | 0.120 |
| | | M12 connector | **XS518BSDAM12** | 0.060 |
| | NO terminals 1 & 4 *(2)* | M12 connector | **XS518BSCAM12** | 0.060 |
| | | Remote M12 connector | **XS518BSCAL08M12** | 0.085 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS518BSDBL2** | 0.120 |
| | | M12 connector | **XS518BSDBM12** | 0.060 |
| **Ø 30, threaded M30 x 1.5** | | | | |
| **10** | NO | Pre-cabled (L = 2 m) *(1)* | **XS530BSDAL2** | 0.205 |
| | | M12 connector | **XS530BSDAM12** | 0.145 |
| | NO terminals 1 & 4 *(2)* | M12 connector | **XS530BSCAM12** | 0.145 |
| | | Remote M12 connector | **XS530BSCAL08M12** | 0.170 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS530BSDBL2** | 0.205 |
| | | M12 connector | **XS530BSDBM12** | 0.145 |

## Accessories *(3)*

| Description | For use with sensors | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 6.5 (plain) | **XSZB165** | 0.005 |
| | Ø 8 | **XSZB108** | 0.006 |
| | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

*(1) For a 5 m cable replace L2 by **L5**; for a 10 m cable replace L2 by **L10**. Please consult our Customer Care Centre for availability.*
*Example: XS508BSCAL2 becomes **XS508BSCAL5** with a 5 m cable.*

*(2) The NO output is connected to terminals 1 and 4 of the M12 connector.*

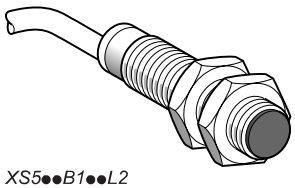
*(3) For more information, see page 118.*

# Inductive proximity sensors

## XS range, general purpose

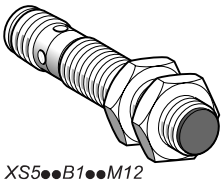
### Cylindrical, standard range, flush mountable
### Two-wire DC

801267

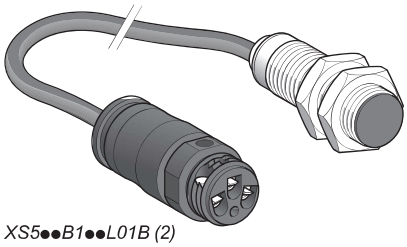


XS5●●B1●●L2

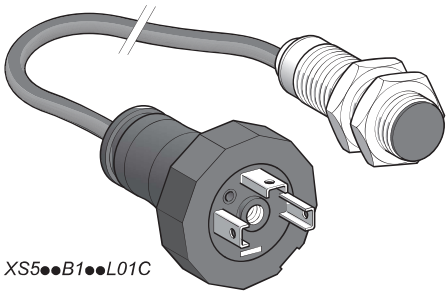
801268



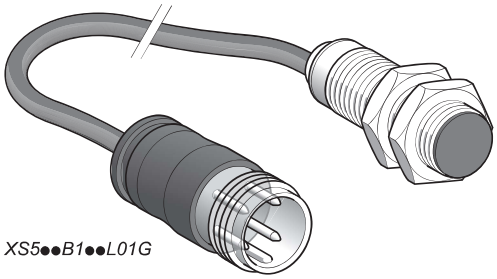
XS5●●B1●●M12



XS5●●B1●●L01B (2)

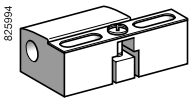


XS5●●B1●●L01C



XS5●●B1●●L01G

825994



XSZB1●●

## Sensors, 2-wire ⎓ 12-48 V, long case model

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **Ø 8, threaded M8 x 1** | | | | |
| **1.5** | NO | Pre-cabled (L = 2 m) *(1)* | **XS508B1DAL2** | 0.035 |
| | | Remote M12 connector | **XS508B1DAL08M12** | 0.050 |
| | | M12 connector | **XS508B1DAM12** | 0.025 |
| | NO terminals 1 & 4 *(3)* | M12 connector | **XS508B1CAM12** | 0.025 |
| | | Remote M12 connector | **XS508B1CAL08M12** | 0.050 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS508B1DBL2** | 0.035 |
| | | M12 connector | **XS508B1DBM12** | 0.025 |
| **Ø 12, threaded M12 x 1** | | | | |
| **2** | NO | Pre-cabled (L = 2 m) *(1)* | **XS512B1DAL2** | 0.075 |
| | | Remote 7/8" connector | **XS512B1DAL08U78** | 0.050 |
| | | M12 connector | **XS512B1DAM12** | 0.035 |
| | NO terminals 1 & 4 *(3)* | M12 connector | **XS512B1CAM12** | 0.035 |
| | | Remote M12 connector | **XS512B1CAL08M12** | 0.060 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS512B1DBL2** | 0.075 |
| | | M12 connector | **XS512B1DBM12** | 0.035 |
| | | Remote M12 connector | **XS512B1DBL08M12** | 0.060 |
| **Ø 18, threaded M18 x 1** | | | | |
| **5** | NO | Pre-cabled (L = 2 m) *(1)* | **XS518B1DAL2** | 0.120 |
| | | Low temperature version (-40 °C) | **XS518B1DAL2TF** *(5)* | 0.120 |
| | | Remote screw terminal connector *(2)* | **XS518B1DAL01B** | 0.085 |
| | | Remote EN 175301-803-A connector | **XS518B1DAL01C** | 0.085 |
| | | Remote M18 connector | **XS518B1DAL01G** | 0.085 |
| | | M12 connector | **XS518B1DAM12** | 0.060 |
| | NO terminals 1 & 4 *(3)* | M12 connector | **XS518B1CAM12** | 0.060 |
| | | Remote M12 connector | **XS518B1CAL08M12** | 0.085 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS518B1DBL2** | 0.120 |
| | | M12 connector | **XS518B1DBM12** | 0.060 |
| | | Remote M12 connector | **XS518B1DBL08M12** | 0.085 |
| | | Remote screw terminal connector *(2)* | **XS518B1DBL01B** | 0.120 |
| **Ø 30, threaded M30 x 1.5** | | | | |
| **10** | NO | Pre-cabled (L = 2 m) *(1)* | **XS530B1DAL2** | 0.205 |
| | | Low temperature version (-40 °C) | **XS530B1DAL2TF** *(5)* | 0.205 |
| | | M12 connector | **XS530B1DAM12** | 0.145 |
| | | Remote screw terminal connector *(2)* | **XS530B1DAL01B** | 0.205 |
| | | Remote EN 175301-803-A connector | **XS530B1DAL01C** | 0.205 |
| | | Remote M18 connector | **XS530B1DAL01G** | 0.205 |
| | NO terminals 1 & 4 *(3)* | M12 connector | **XS530B1CAM12** | 0.145 |
| | | Remote M12 connector | **XS530B1CAL08M12** | 0.170 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS530B1DBL2** | 0.205 |
| | | M12 connector | **XS530B1DBM12** | 0.145 |
| | | Remote screw terminal connector *(2)* | **XS530B1DBL01B** | 0.205 |

## Accessories *(4)*

| Description | For use with sensors | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 8 | **XSZB108** | 0.006 |
| | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

*(1) For a 5 m cable replace L2 by **L5**; for a 10 m cable replace L2 by **L10**. Please consult our Customer Care Centre for availability.*
*Example: XS508B1DAL2 becomes **XS508B1DAL5** with a 5 m cable.*

*(2) Protective cable gland included with sensor.*

*(3) The NO output is connected to terminals 1 and 4 of the M12 connector.*

*(4) For more information, see page 118.*

*(5) For a 5 m cable replace L2 by **L5**. Please consult our Customer Care Centre for availability.*
*Example: XS518B1DAL2TF becomes **XS518B1DAL5TF** with a 5 m cable.*
*For a PUR cable, replace the letter L by P in the reference.*
*Example: XS518B1DAL2TF becomes **XS518B1DAP2TF**.*
*For a 5 m PUR cable, replace P2 by **P5**.*

# Inductive proximity sensors

## XS range, general purpose

Cylindrical, standard range, flush mountable
Two-wire DC

## Characteristics

| Sensor type | | | XS5●●B1●●M12, XS5●●BS●●M12 | XS5●●B1D●L2, XS5●●BS●●L2 |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | |
| **Connection** | Connector | | M12 | – |
| | Pre-cabled | | – | Length: 2 m |
| | Remote connector | | M12 (L01M12), screw terminal (L01B), EN 175301-803-A (L01C) and M18 (L01G) remote connectors on 0.15 m flying lead<br>M12 (L08M12) and 7/8" (L08U78) remote connectors on 0.80 m flying lead | |
| **Operating zone** | Ø 6.5 | **mm** | **0…1.2** | |
| | 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 effective sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 65 and IP 67 | IP 65 and IP 68, double insulation ⧈<br>(except Ø 6.5 and Ø 8: IP 67) |
| **Storage temperature** | | **°C** | -40…+85 | |
| **Operating temperature** | | **°C** | -25…+70; TF products: -40…+70 | |
| **Materials** | Case | | Nickel plated brass (except XS506 and XS508B1: stainless steel, grade 303) | |
| | Sensing face | | PPS | |
| | Cable | | – | PvR 2 x 0.34 mm²<br>(except XS506 and XS508: 2 x 0.11 mm²)<br>PUR available *(1)* |
| **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:<br>annular |
| **Rated supply voltage** | | **V** | ⎓ 12…48 non polarised for XS5●●B1●<br>⎓ 12…24 non polarised for XS5●●BS (except Ø 6.5 short and Ø 8 short: polarised) with protection against reverse polarity | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 10…58 for XS5●●B1●<br>⎓ 10…36 for XS5●●BS | |
| **Switching capacity** | | **mA** | 1.5...100 with overload and short-circuit protection | |
| **Voltage drop, closed state** | | **V** | ≤ 4.2 | |
| **Residual current, open state** | | **mA** | ≤ 0.5 | |
| **Maximum switching frequency** | **XS506, XS508** | **Hz** | 1000 for XS5●●BS, 1400 for XS5●●B1● | |
| | **XS512** | **Hz** | 1000 | |
| | **XS518** | **Hz** | 1200 | |
| | **XS530** | **Hz** | 1300 | |
| **Delays** | First-up | **ms** | ≤ 10 | |
| | Response | **ms** | ≤ 0.5: **XS506, XS508** and **XS512**<br>≤ 0.6: **XS518**<br>≤ 0.6: **XS530** | |
| | Recovery | **ms** | ≤ 0.2 (except **XS530** ≤ 0.4) | |

*(1) For PUR cable, replace the letter L in the reference by **P**. Example: XS506BSCAL2 becomes **XS506BSCAP2** with a PUR cable.*

# Inductive proximity sensors

## XS range, general purpose

Cylindrical, standard range, flush mountable
Two-wire DC

## Wiring schemes

**Connector**

**M12**

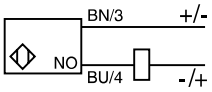
**Pre-cabled**

BU: Blue
BN: Brown

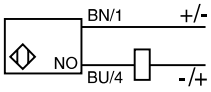
**2-wire ⎓ non polarised**

**NO output**

**XS5••B•DA•••**

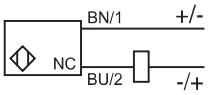



**XS5••B1CA•••**




**NC output**

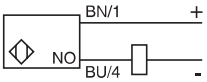
**XS5••B•DB•••**




**2-wire ⎓ polarised**

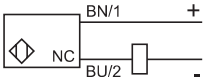
**NO output**

**XS5••BSCA•••**




**NC output**

**XS5••BSCB•••**

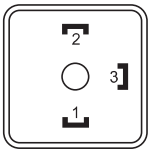



**Remote connectors L01B, L01C, L01G, U78**

**Screw terminal (L01B)**

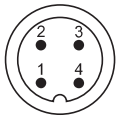
The terminal numbering differs according to the version (2-wire ⎓, 3-wire ⎓, 2-wire ∿).

**EN 175301-803-A (L01C)**

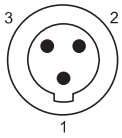



*The NO or NC outputs are connected to terminal 2.*

**M18 (L01G)**



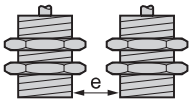

**7/8" (U78)**

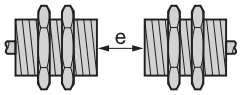


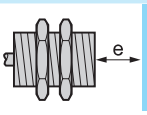

*Terminal 1: not connected*
*Terminal 2: +/–*
*Terminal 3: +/–*

## Setting-up

**Minimum mounting distances (mm)**

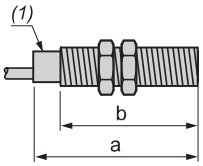



| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 6.5 | e ⩾ 3 | e ⩾ 18 | e ⩾ 4.5 |
| Ø 8 | e ⩾ 3 | e ⩾ 18 | e ⩾ 4.5 |
| Ø 12 | e ⩾ 4 | e ⩾ 24 | e ⩾ 6 |
| Ø 18 | e ⩾ 10 | e ⩾ 60 | e ⩾ 15 |
| Ø 30 | e ⩾ 20 | e ⩾ 120 | e ⩾ 30 |

## Dimensions




*(1) LED*

| Sensors | | Pre-cabled (mm) | | M8 connector (mm) | | M12 connector (mm) | |
|---|---|---|---|---|---|---|---|
| **Short case model** | | **a** | **b** | **a** | **b** | **a** | **b** |
| Ø 6.5 | **XS506BS** | 33 | – | 42 | – | 45 | – |
| Ø 8 | **XS508BS** | 33 | 25 | 42 | 26 | 45 | 24 |
| Ø 12 | **XS512BS** | 35 | 25 | – | – | 50 | 30 |
| Ø 18 | **XS518BS** | 40 | 28 | – | – | 50 | 28 |
| Ø 30 | **XS530BS** | 44 | 32 | – | – | 55 | 32 |

| Sensors | | Pre-cabled (mm) | | M12 connector (mm) | |
|---|---|---|---|---|---|
| **Long case model** | | **a** | **b** | **a** | **b** |
| Ø 8 | **XS508B1** | 51 | 42 | 62 | 40 |
| Ø 12 | **XS512B1** | 54 | 42 | 61 | 42 |
| Ø 18 | **XS518B1** | 56 | 44 | 64 | 44 |
| Ø 30 | **XS530B1** | 54 | 42 | 72 | 41 |

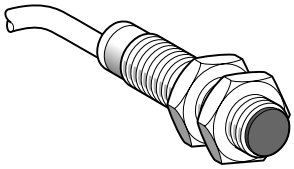
# Inductive proximity sensors

## XS range, general purpose

Cylindrical, standard range, flush mountable

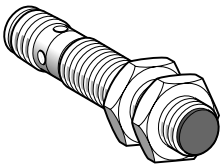
Two-wire AC or DC *(1)*

801277



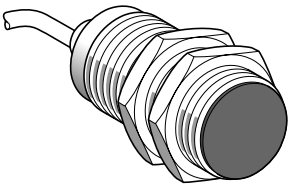
*XS5●●B1M●L2*

801278



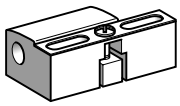
*XS5●●B1M●U20*

822115



*XS530B1●●L2*

825994



*XSZB1●●*

### Sensors, 2-wire ≂ 24-240 V, long case model

**Ø 12, threaded M12 x 1**

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **2** | NO | Pre-cabled (L = 2 m) *(2)* | **XS512B1MAL2** | 0.075 |
| | | 1/2"-20 UNF connector | **XS512B1MAU20** | 0.025 |
| | NC | Pre-cabled (L = 2 m) *(2)* | **XS512B1MBL2** | 0.075 |
| | | 1/2"-20 UNF connector | **XS512B1MBU20** | 0.025 |

**Ø 18, threaded M18 x 1**

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **5** | NO | Pre-cabled (L = 2 m) *(2)* | **XS518B1MAL2** | 0.100 |
| | | 1/2"-20 UNF connector | **XS518B1MAU20** | 0.060 |
| | NC | Pre-cabled (L = 2 m) *(2)* | **XS518B1MBL2** | 0.100 |
| | | 1/2"-20 UNF connector | **XS518B1MBU20** | 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) *(2)* | **XS530B1MAL2** | 0.205 |
| | | 1/2"-20 UNF connector | **XS530B1MAU20** | 0.145 |
| | NC | Pre-cabled (L = 2 m) *(2)* | **XS530B1MBL2** | 0.205 |
| | | 1/2"-20 UNF connector | **XS530B1MBU20** | 0.145 |

### Accessories *(3)*

| Description | For use with sensors | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

*(1) Ø8 plastic, double insulation version available (see page 64).*

*(2) For a 5 m cable replace L2 by **L5**; for a 10 m cable replace L2 by **L10**. Please consult our Customer Care Centre for availability.*
*Example: **XS512B1MAL2** becomes **XS512B1MAL5** with a 5 m cable.*

*(3) For more information, see page 118.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

## XS range, general purpose

Cylindrical, standard range, flush mountable
Two-wire AC or DC

## Characteristics

| Sensor type | | | XS5●●B1M●U20 | XS5●●B1M●L2 |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | |
| **Connection** | Connector | | 1/2"-20 UNF | – |
| | Pre-cabled | | – | Length: 2 m |
| **Operating zone** | Ø 12 | **mm** | **0…1.6** | |
| | Ø 18 | **mm** | **0…4** | |
| | Ø 30 | **mm** | **0…8** | |
| **Differential travel** | | **%** | 1...15 of effective sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 65 and IP 67 | IP 65 and IP 68, double insulation ⧈ |
| | Conforming to DIN 40050 | | IP 69K | |
| **Storage temperature** | | **°C** | -40…+85 | |
| **Operating temperature** | | **°C** | -25…+70 | |
| **Materials** | Case | | Nickel plated brass | |
| | Sensing face | | PPS | |
| | 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** | **XS512B1M●●●** | **mA** | 5…200 *(1)* | |
| | **XS518B1M●●●, XS530B1M●●●** | **mA** | ∼ 5…300 or ⎓ 5…200 *(1)* | |
| **Voltage drop, closed state** | | **V** | ⩽ 5.5 | |
| **Residual current, open state** | | **mA** | ⩽ 0.8 | |
| **Maximum switching frequency** | **XS512B1●●●, XS518B1M●●●** | **Hz** | ∼ 25 or ⎓ 1000 | |
| | **XS530B1M●●●** | **Hz** | ∼ 25 or ⎓ 500 | |
| **Delays** | First-up | **ms** | ⩽ 20 **XS512B1M●●●**<br>⩽ 25 **XS518B1M●●●** and **XS530B1M●●●** | |
| | Response | **ms** | ⩽ 0.5 | |
| | Recovery | **ms** | ⩽ 0.2 **XS512B1M●●●**<br>⩽ 0.5 **XS518B1M●●●**<br>⩽ 2 **XS518B1M●●●** | |

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

## Wiring schemes

**Connector**

1/2"-20 UNF

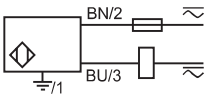
⎓: 2
⏚: 1
⎓: 3

**Pre-cabled**

BU: Blue
BN: Brown

**2-wire ∼ or ⎓**

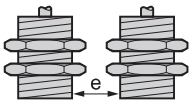
**NO or NC output**

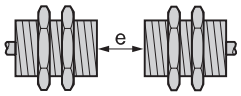


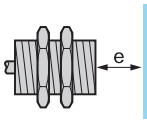

*⏚: on connector models only*

## Setting-up

**Minimum mounting distances (mm)**

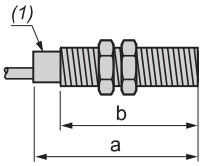



| Sensor | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 12 | e ⩾ 8 | e ⩾ 48 | e ⩾ 12 |
| Ø 18 | e ⩾ 16 | e ⩾ 100 | e ⩾ 25 |
| Ø 30 | e ⩾ 30 | e ⩾ 180 | e ⩾ 45 |

## Dimensions



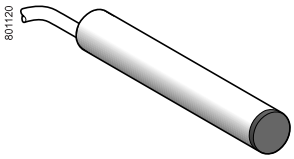

*(1) LED*

| Sensor | XS6 Pre-cabled (mm) a | XS6 Pre-cabled (mm) b | XS6 Connector (mm) a | XS6 Connector (mm) b |
|---|---|---|---|---|
| **XS512B1M** | 53 | 42 | 62 | 42 |
| **XS518B1M** | 62 | 52 | 73 | 52 |
| **XS530B1M** | 62 | 52 | 73 | 52 |

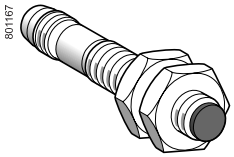
# Inductive proximity sensors

## XS range, general purpose

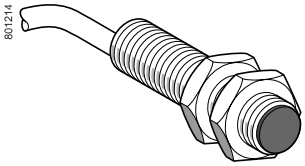
Cylindrical, increased range, flush mountable
Three-wire DC, solid-state output




*XS106B3●●L2*




*XS108B3●●M8*




*XS112B3●●L2*

### Sensors, 3-wire ⎓ 12-24 V, short case model

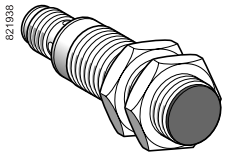
| Sensing distance (Sn) mm | Function | Output | Connection | Sold in lots of | Unit reference | Weight kg |
|---|---|---|---|---|---|---|
| **Ø 6.5, plain** | | | | | | |
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS106B3PAL2** | 0.060 |
| | | | M8 connector | 1 | **XS106B3PAM8** | 0.030 |
| | | | M12 connector | 1 | **XS106B3PAM12** | 0.050 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS106B3PAL2TQ** | 0.980 |
| | | | M8 connector | 20 | **XS106B3PAM8TQ** | 0.320 |
| | | NPN | Pre-cabled (L = 2 m) | 1 | **XS106B3NAL2** | 0.060 |
| | | | M8 connector | 1 | **XS106B3NAM8** | 0.030 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS106B3PBL2** | 0.060 |
| | | | M8 connector | 1 | **XS106B3PBM8** | 0.030 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS106B3NBL2** | 0.060 |
| | | | M8 connector | 1 | **XS106B3NBM8** | 0.030 |
| **Ø 8, threaded M8 x 1** | | | | | | |
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS108B3PAL2** | 0.070 |
| | | | M8 connector | 1 | **XS108B3PAM8** | 0.030 |
| | | | M12 connector | 1 | **XS108B3PAM12** | 0.060 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS108B3PAL2TQ** | 1.120 |
| | | | M8 connector | 20 | **XS108B3PAM8TQ** | 0.460 |
| | | | M12 connector | 20 | **XS108B3PAM12TQ** | 0.940 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS108B3NAL2** | 0.070 |
| | | | M8 connector | 1 | **XS108B3NAM8** | 0.030 |
| | | | M12 connector | 1 | **XS108B3NAM12** | 0.060 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS108B3NAL2TQ** | 1.120 |
| | | | M8 connector | 20 | **XS108B3NAM8TQ** | 0.460 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS108B3PBL2** | 0.070 |
| | | | M8 connector | 1 | **XS108B3PBM8** | 0.030 |
| | | | M12 connector | 1 | **XS108B3PBM12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS108B3NBL2** | 0.070 |
| | | | M8 connector | 1 | **XS108B3NBM8** | 0.030 |
| | | | M12 connector | 1 | **XS108B3NBM12** | 0.060 |
| **Ø 12, threaded M12 x 1** | | | | | | |
| **4** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS112B3PAL2** | 0.090 |
| | | | M12 connector | 1 | **XS112B3PAM12** | 0.030 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS112B3PAL2TQ** | 1.600 |
| | | | M12 connector | 20 | **XS112B3PAM12TQ** | 0.470 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS112B3NAL2** | 0.090 |
| | | | M12 connector | 1 | **XS112B3NAM12** | 0.030 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS112B3NAL2TQ** | 1.600 |
| | | | M12 connector | 20 | **XS112B3NAM12TQ** | 0.470 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS112B3PBL2** | 0.090 |
| | | | M12 connector | 1 | **XS112B3PBM12** | 0.030 |
| | | | M12 connector | 20 | **XS112B3PBM12TQ** | 0.470 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS112B3NBL2** | 0.090 |
| | | | M12 connector | 1 | **XS112B3NBM12** | 0.030 |

*(1) For a 5 m long cable replace L2 by **L5**. Please consult our Customer Care Centre for availability.*
*Example: XS106B3PAL2 becomes **XS106B3PAL5** with a 5 m cable.*

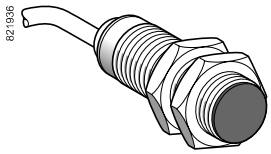
# Inductive proximity sensors

## XS range, general purpose

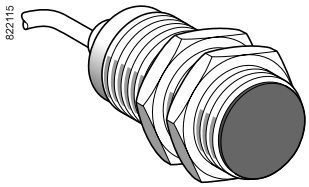
Cylindrical, increased range, flush mountable
Three-wire DC, solid-state output



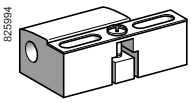

*XS118B3●●M12*




*XS118B3●●L2*




*XS130B3●●L2*




*XSZB1●●*

### Sensors, 3-wire ⎓ 12-24 V, short case model *(continued)*

| Sensing distance (Sn) mm | Function | Output | Connection | Sold in lots of | Unit reference | Weight kg |
|---|---|---|---|---|---|---|
| **Ø 18, threaded M18 x 1** | | | | | | |
| **8** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS118B3PAL2** | 0.110 |
| | | | M12 connector | 1 | **XS118B3PAM12** | 0.060 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS118B3PAL2TQ** | 2.000 |
| | | | M12 connector | 20 | **XS118B3PAM12TQ** | 1.140 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS118B3NAL2** | 0.110 |
| | | | M12 connector | 1 | **XS118B3NAM12** | 0.060 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS118B3NAL2TQ** | 2.000 |
| | | | M12 connector | 20 | **XS118B3NAM12TQ** | 1.140 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS118B3PBL2** | 0.110 |
| | | | M12 connector | 1 | **XS118B3PBM12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS118B3NBL2** | 0.110 |
| | | | M12 connector | 1 | **XS118B3NBM12** | 0.060 |
| **Ø 30, threaded M30 x 1.5** | | | | | | |
| **15** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS130B3PAL2** | 0.180 |
| | | | M12 connector | 1 | **XS130B3PAM12** | 0.130 |
| | | | Pre-cabled (L = 2 m) | 20 | **XS130B3PAL2TQ** | 3.360 |
| | | | M12 connector | 20 | **XS130B3PAM12TQ** | 2.000 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS130B3NAL2** | 0.180 |
| | | | M12 connector | 1 | **XS130B3NAM12** | 0.130 |
| | | | M12 connector | 20 | **XS130B3NAM12TQ** | 2.000 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | 1 | **XS130B3PBL2** | 0.180 |
| | | | M12 connector | 1 | **XS130B3PBM12** | 0.130 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | 1 | **XS130B3NBL2** | 0.180 |
| | | | M12 connector | 1 | **XS130B3NBM12** | 0.130 |

### Accessories *(2)*

| Description | For use with sensors | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 6.5 (plain) | **XSZB165** | 0.005 |
| | Ø 8 (M8 x1) | **XSZB108** | 0.006 |
| | Ø 12 (M12 x1) | **XSZB112** | 0.006 |
| | Ø 18 (M18 x1) | **XSZB118** | 0.010 |
| | Ø 30 (M30 x 1.5) | **XSZB130** | 0.020 |

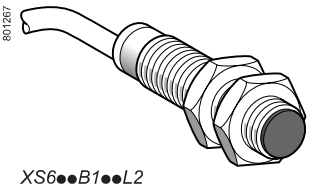
*(1) For a 5 m cable, replace L2 by **L5**. Please consult our Customer Care Centre for availability. Example: XS118B3PAL2 becomes **XS118B3PAL5** with a 5 m cable.*

*(2) For more information, see page 118.*

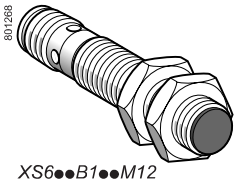
# Inductive proximity sensors

## XS range, general purpose

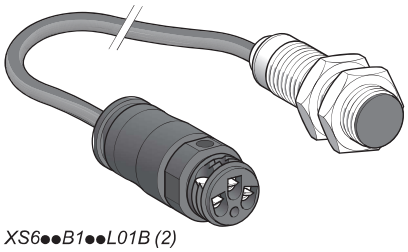
Cylindrical, increased range, flush mountable
Three-wire DC, solid-state output



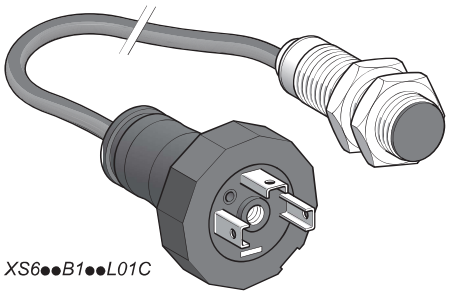

XS6●●B1●●L2



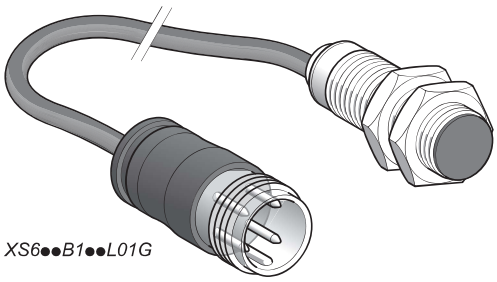

XS6●●B1●●M12



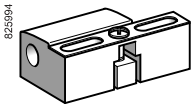
XS6●●B1●●L01B (2)



XS6●●B1●●L01C



XS6●●B1●●L01G




XSZB●●●

### Sensors, 3-wire ⎓ 12-48 V, long case model

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Ø 8, threaded M8 x 1** | | | | | |
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS608B1PAL2** | 0.035 |
| | | | M8 connector | **XS608B1PAM8** | 0.015 |
| | | | M12 connector | **XS608B1PAM12** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS608B1NAL2** | 0.035 |
| | | | M8 connector | **XS608B1NAM8** | 0.015 |
| | | | M12 connector | **XS608B1NAM12** | 0.015 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS608B1PBL2** | 0.035 |
| | | | M8 connector | **XS608B1PBM8** | 0.015 |
| | | | M12 connector | **XS608B1PBM12** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS608B1NBL2** | 0.035 |
| | | | M8 connector | **XS608B1NBM8** | 0.015 |
| | | | M12 connector | **XS608B1NBM12** | 0.015 |
| **Ø 12, threaded M12 x 1** | | | | | |
| **4** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS612B1PAL2** | 0.075 |
| | | | M12 connector | **XS612B1PAM12** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS612B1NAL2** | 0.075 |
| | | | M12 connector | **XS612B1NAM12** | 0.020 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS612B1PBL2** | 0.075 |
| | | | M12 connector | **XS612B1PBM12** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS612B1NBL2** | 0.075 |
| | | | M12 connector | **XS612B1NBM12** | 0.020 |
| **Ø 18, threaded M18 x 1** | | | | | |
| **8** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS618B1PAL2** | 0.100 |
| | | | M12 connector | **XS618B1PAM12** | 0.040 |
| | | | Remote screw terminal connector | **XS618B1PAL01B** *(2)* | 0.100 |
| | | | Remote EN 175301-803-A connector | **XS618B1PAL01C** | 0.100 |
| | | | Remote M18 connector | **XS618B1PAL01G** | 0.100 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS618B1NAL2** | 0.100 |
| | | | M12 connector | **XS618B1NAM12** | 0.040 |
| | | | Remote screw terminal connector | **XS618B1NAL01B** *(2)* | 0.100 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS618B1PBL2** | 0.100 |
| | | | M12 connector | **XS618B1PBM12** | 0.040 |
| | | | Remote screw terminal connector | **XS618B1PBL01B** *(2)* | 0.100 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS618B1NBL2** | 0.100 |
| | | | M12 connector | **XS618B1NBM12** | 0.040 |
| **Ø 30, threaded M30 x 1.5** | | | | | |
| **15** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS630B1PAL2** | 0.205 |
| | | | M12 connector | **XS630B1PAM12** | 0.145 |
| | | | Remote screw terminal connector | **XS630B1PAL01B** *(2)* | 0.205 |
| | | | Remote EN 175301-803-A connector | **XS630B1PAL01C** | 0.205 |
| | | | Remote M18 connector | **XS630B1PAL01G** | 0.205 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS630B1NAL2** | 0.205 |
| | | | M12 connector | **XS630B1NAM12** | 0.145 |
| | | | Remote screw terminal connector | **XS630B1NAL01B** *(2)* | 0.205 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS630B1PBL2** | 0.205 |
| | | | M12 connector | **XS630B1PBM12** | 0.145 |
| | | | Remote EN 175301-803-A connector | **XS630B1PBL01C** | 0.205 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS630B1NBL2** | 0.205 |
| | | | M12 connector | **XS630B1NBM12** | 0.145 |

### Accessories *(3)*

| Description | For use with sensors | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 8 | **XSZB108** | 0.006 |
| | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**. Please consult our Customer Care Centre for availability.*
*Example: XS608B1PAL2 becomes **XS608B1PAL5** with a 5 m cable.*
*(2) Protective cable gland included with sensor.*

# Inductive proximity sensors

## XS range, general purpose

Cylindrical, increased range, flush mountable
Three-wire DC, solid-state output

## Characteristics

| Sensor type | | | XS1/XS6●●B●●●M8 | XS1/XS6●●B●●●M12 | XS1/XS6●●B●●●L2 |
|---|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE, E2 | | |
| **Connection** | Connector | | M8 | M12 | – |
| | Pre-cabled | | – | – | Length 2 m |
| | Remote connector | | Screw terminal (L01B), EN 175301-803-A (L01C) and M18 (L01G) remote connectors on 0.15 m flying lead | | |
| **Operating zone** *(1)* | 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 effective sensing distance (Sr) | | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 65 and IP 67 | | IP 65 and IP 68, double insulation ⧈ except Ø 6.5 and Ø 8: IP 67 |
| | Conforming to DIN 40050 | | IP 69K | | |
| **Storage temperature** | | **°C** | -40…+85 | | |
| **Operating temperature** | | **°C** | -25…+70 | | |
| **Materials** | Case | | Nickel plated brass (except Ø 6.5 and Ø 8: stainless steel, grade 303) | | |
| | Sensing face | | PPS | | |
| | 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** | **XS1**: ⎓ 12…24 with protection against reverse polarity<br>**XS6**: ⎓ 12…48 with protection against reverse polarity | | |
| **Voltage limits (including ripple)** | | **V** | **XS1:** ⎓ 10…36; **XS6:** ⎓ 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** | 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 6.5, Ø 8 and Ø 12, ⩽ 0.3 for Ø 18, ⩽ 0.6 for Ø 30 | | |
| | Recovery | **ms** | ⩽ 0.2 for Ø 6.5, Ø 8 and Ø 12, ⩽ 0.7 for Ø 18, ⩽ 1.4 for Ø 30 | | |

*(1) Detection curves, see page 122.*

## Wiring schemes

### Connector *(1)*

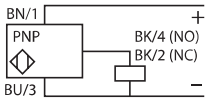
M8

M12

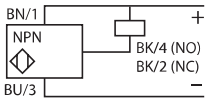
### Pre-cabled

BU: Blue
BN: Brown
BK: Black

### PNP



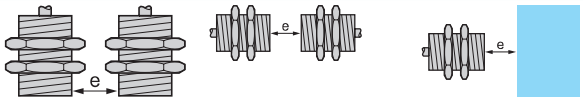

### NPN




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

## Setting-up

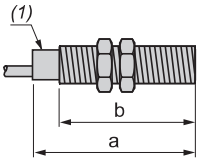
### Minimum mounting distances (mm)




| Sensors | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 6.5 | e ⩾ 5 | e ⩾ 30 | e ⩾ 8 |
| Ø 8 | e ⩾ 5 | e ⩾ 30 | e ⩾ 8 |
| Ø 12 | e ⩾ 8 | e ⩾ 48 | e ⩾ 12 |
| Ø 18 | e ⩾ 16 | e ⩾ 100 | e ⩾ 25 |
| Ø 30 | e ⩾ 30 | e ⩾ 180 | e ⩾ 45 |

*(1) For pin arrangement of remote connectors L01B, L01C and L01G, see page 29.*

## Dimensions




*(1) LED*

| Sensors | | Pre-cabled (mm) | | M8 connector (mm) | | M12 connector (mm) | |
|---|---|---|---|---|---|---|---|
| **Short case model** | | **a** | **b** | **a** | **b** | **a** | **b** |
| Ø 6.5 | **XS106B3** | 34 | – | 42 | – | 45 | – |
| Ø 8 | **XS108B3** | 34 | 25 | 42 | 27 | 45 | 23 |
| Ø 12 | **XS112B3** | 35 | 25 | – | – | 50 | 30 |
| Ø 18 | **XS118B3** | 39 | 28 | – | – | 50 | 28 |
| Ø 30 | **XS130B3** | 43 | 32 | – | – | 55 | 32 |

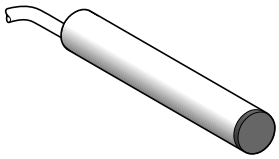
| Sensors | | Pre-cabled (mm) | | M8 connector (mm) | | M12 connector (mm) | |
|---|---|---|---|---|---|---|---|
| **Long case model** | | **a** | **b** | **a** | **b** | **a** | **b** |
| Ø 8 | **XS608B1** | 51 | 42 | 58 | 43 | 61 | 40 |
| Ø 12 | **XS612B1** | 53 | 42 | – | – | 61 | 42 |

# Inductive proximity sensors

## XS range, general purpose

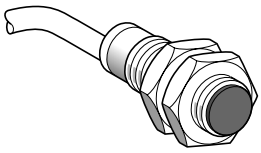
Cylindrical, increased range, flush mountable
Two-wire DC, solid-state output

801120



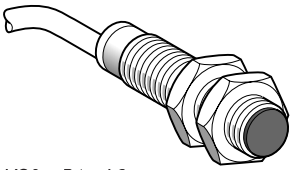
XS606B3●●L2

801231



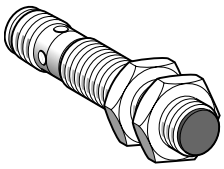
XS612B3●●L2

801267



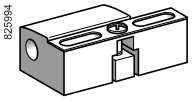
XS6●●B1●●L2

801268



XS6●●B1●●M12

825994



XSZB1●●

### Sensors, 2-wire ⎓ 12-24 V, short case model

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **Ø 6.5, plain** | | | | |
| **2.5** | NO | Pre-cabled (L = 2 m) *(1)* | **XS606B3CAL2** | 0.060 |
| | | Remote M12 connector | **XS606B3CAL01M12** | 0.070 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS606B3CBL2** | 0.060 |
| **Ø 8, threaded M8 x 1** | | | | |
| **2.5** | NO | Pre-cabled (L = 2 m) *(1)* | **XS608B3CAL2** | 0.070 |
| | | Remote M12 connector | **XS608B3CAL01M12** | 0.070 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS608B3CBL2** | 0.070 |
| | | Remote M12 connector | **XS608B3CBL01M12** | 0.070 |
| **Ø 12, threaded M12 x 1** | | | | |
| **4** | NO | Pre-cabled (L = 2 m) *(1)* | **XS612B3DAL2** | 0.090 |
| | | M12 connector | **XS612B3DAM12** | 0.030 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS612B3DBL2** | 0.090 |
| | | M12 connector | **XS612B3DBM12** | 0.030 |
| **Ø 18, threaded M18 x 1** | | | | |
| **8** | NO | Pre-cabled (L = 2 m) *(1)* | **XS618B3DAL2** | 0.110 |
| | | M12 connector | **XS618B3DAM12** | 0.060 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS618B3DBL2** | 0.110 |
| | | M12 connector | **XS618B3DBM12** | 0.060 |
| **Ø 30, threaded M30 x 1.5** | | | | |
| **15** | NO | Pre-cabled (L = 2 m) *(1)* | **XS630B3DAL2** | 0.180 |
| | | M12 connector | **XS630B3DAM12** | 0.130 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS630B3DBL2** | 0.180 |
| | | M12 connector | **XS630B3DBM12** | 0.180 |

### Sensors, 2-wire ⎓ 12-48 V, long case model

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **Ø 6.5, plain** | | | | |
| **2.5** | NO | Pre-cabled (L = 2 m) *(1)* | **XS606B1DAL2** | 0.060 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS606B1DBL2** | 0.060 |
| **Ø 8, threaded M8 x 1** | | | | |
| **2.5** | NO | Pre-cabled (L = 2 m) *(1)* | **XS608B1DAL2** | 0.035 |
| | | M12 connector | **XS608B1DAM12** | 0.015 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS608B1DBL2** | 0.035 |
| | | M12 connector | **XS608B1DBM12** | 0.015 |
| **Ø 12, threaded M12 x 1** | | | | |
| **4** | NO | Pre-cabled (L = 2 m) *(1)* | **XS612B1DAL2** | 0.180 |
| | | M12 connector | **XS612B1DAM12** | 0.020 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS612B1DBL2** | 0.075 |
| | | M12 connector | **XS612B1DBM12** | 0.020 |
| **Ø 18, threaded M18 x 1** | | | | |
| **8** | NO | Pre-cabled (L = 2 m) *(1)* | **XS618B1DAL2** | 0.100 |
| | | M12 connector | **XS618B1DAM12** | 0.040 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS618B1DBL2** | 0.100 |
| | | M12 connector | **XS618B1DBM12** | 0.040 |
| **Ø 30, threaded M30 x 1.5** | | | | |
| **15** | NO | Pre-cabled (L = 2 m) *(1)* | **XS630B1DAL2** | 0.205 |
| | | M12 connector | **XS630B1DAM12** | 0.145 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS630B1DBL2** | 0.205 |
| | | M12 connector | **XS630B1DBM12** | 0.145 |

### Accessories *(2)*

| Description | For use with sensors | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 6.5 (plain) | **XSZB165** | 0.005 |
| | Ø 8 (M8 x1) | **XSZB108** | 0.006 |
| | Ø 12 (M12 x1) | **XSZB112** | 0.006 |
| | Ø 18 (M18 x1) | **XSZB118** | 0.010 |
| | Ø 30 (M30 x 1.5) | **XSZB130** | 0.020 |

*(1) For a 5 m cable, replace L2 by **L5**. Please consult our Customer Care Centre for availability.*
*Example: XS606B3CAL2 becomes **XS606B3CAL5** with a 5 m cable.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

## XS range, general purpose

Cylindrical, increased range, flush mountable
Two-wire DC, solid-state output

## Characteristics

| Sensor type | | | XS6●●B3●●M12<br>XS6●●B1D●M12 | XS6●●B3●●L2<br>XS6●●B1D●L2 |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | |
| **Connection** | Connector | | M12 or remote M12 connector (L01M12) on 0.15 m flying lead | |
| | Pre-cabled | | Length 2 m | |
| **Operating zone** *(1)* | 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 effective sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 65 and IP 67 | IP 65 and IP 68, double insulation ⧈ (except Ø 6.5 and Ø 8: IP 67) |
| | Conforming to DIN 40050 | | IP 69K | |
| **Storage temperature** | | °C | -40…+85 | |
| **Operating temperature** | | °C | -25…+70 | |
| **Materials** | Case | | Nickel plated brass (except XS606B1D or XS608B1D: stainless steel, grade 303) | |
| | Sensing face | | PPS | |
| | Cable | | PvR 2 x 0.34 mm² except Ø 6.5 and 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, 4 viewing ports at 90° | |
| **Rated supply voltage** | | V | ⎓ 12…48 non polarised for XS6●●B1D<br>⎓ 12…24 non polarised for XS6●●B3● (except Ø 6.5 short and Ø 8 short: polarised), with protection against reverse polarity | |
| **Voltage limits (including ripple)** | | V | ⎓ 10…58 for XS6●●B1D<br>⎓ 10…36 for XS6●●B3● | |
| **Switching capacity** | | mA | ⩽ 100 with overload and short-circuit protection | |
| **Voltage drop, closed state** | | V | ⩽ 4.2 | |
| **Residual current, open state** | | mA | ⩽ 0.5 mA | |
| **Maximum switching frequency** | Ø 6.5, Ø 8 | Hz | 1400 for XS6●●B1D, 1100 for XS6●●B3● | |
| | Ø 12 | Hz | 1300 | |
| | Ø 18 | Hz | 1500 | |
| | Ø 30 | Hz | 800 | |
| **Delays** | First-up | ms | ⩽ 10 | |
| | Response | ms | ⩽ 0.5 | |
| | Recovery | ms | ⩽ 0.2 for Ø 6.5, Ø 8 and Ø 12; 0.3 for Ø 18; 0.6 for Ø 30 | |

*(1) Detection curves, see page 122.*

## Wiring schemes

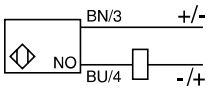
**M12 connector**

**Pre-cabled**

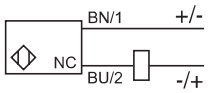
BU: Blue
BN: Brown

**2-wire ⎓ non polarised**

**NO output**

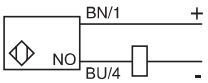



**NC output**

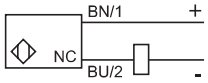



**2-wire ⎓ polarised**

**XS6●●B3CA**

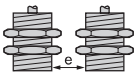


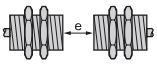

**XS6●●B3CB**

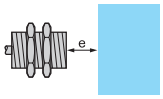



## Setting-up

**Minimum mounting distances (mm)**

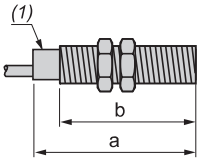



| Sensors | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 6.5 | e ⩾ 5 | e ⩾ 30 | e ⩾ 8 |
| Ø 8 | e ⩾ 5 | e ⩾ 30 | e ⩾ 8 |
| Ø 12 | e ⩾ 8 | e ⩾ 48 | e ⩾ 12 |
| Ø 18 | e ⩾ 16 | e ⩾ 100 | e ⩾ 25 |
| Ø 30 | e ⩾ 30 | e ⩾ 180 | e ⩾ 45 |

## Dimensions




*(1) LED*

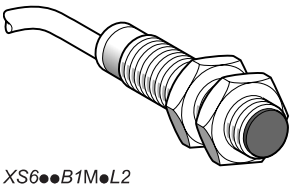
| Sensors | | Pre-cabled (mm) | | M12 connector (mm) | |
|---|---|---|---|---|---|
| **Short case model** | | **a** | **b** | **a** | **b** |
| Ø 6.5 | **XS606B3C** | 33 | – | – | – |
| Ø 8 | **XS608B3C** | 33 | 25 | – | 24 |
| Ø 12 | **XS612B3D** | 35 | 25 | 50 | 30 |
| Ø 18 | **XS618B3D** | 40 | 28 | 50 | 28 |
| Ø 30 | **XS630B3D** | 44 | 32 | 55 | 32 |
| **Long case model** | | **a** | **b** | **a** | **b** |
| Ø 6.5 | **XS606B1D** | 50 | – | – | – |
| Ø 8 | **XS608B1D** | 51 | 42 | 62 | 40 |
| Ø 12 | **XS612B1D** | 53 | 42 | 61 | 42 |

# Inductive proximity sensors

## XS range, general purpose

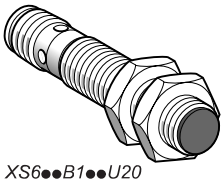
### Cylindrical, increased range, flush mountable
### Two-wire AC or DC *(1)*

801267

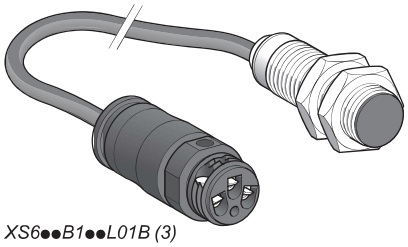


*XS6●●B1M●L2*

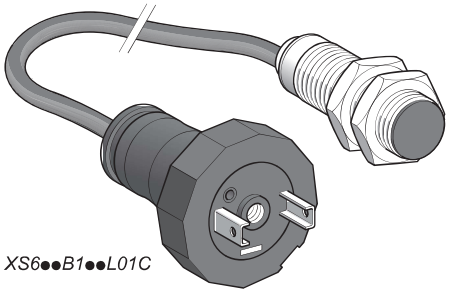
801268



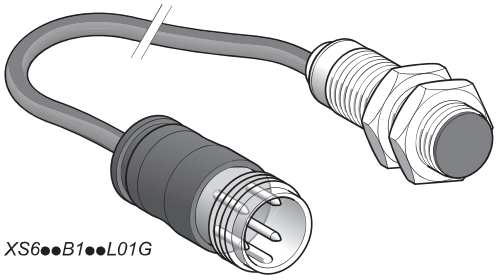
*XS6●●B1●●U20*



*XS6●●B1●●L01B (3)*

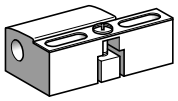


*XS6●●B1●●L01C*



*XS6●●B1●●L01G*

825994



*XSZB1●●*

## Sensors, 2-wire ≂ 24-240 V, long case model

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **Ø 12, threaded M12 x 1** | | | | |
| **4** | NO | Pre-cabled (L = 2 m) *(2)* | **XS612B1MAL2** | 0.075 |
| | | 1/2"-20 UNF connector | **XS612B1MAU20** | 0.025 |
| | NC | Pre-cabled (L = 2 m) *(2)* | **XS612B1MBL2** | 0.075 |
| | | 1/2"-20 UNF connector | **XS612B1MBU20** | 0.025 |
| **Ø 18, threaded M18 x 1** | | | | |
| **8** | NO | Pre-cabled (L = 2 m) *(2)* | **XS618B1MAL2** | 0.100 |
| | | 1/2"-20 UNF connector | **XS618B1MAU20** | 0.060 |
| | | Remote screw terminal connector | **XS618B1MAL01B** *(3)* | 0.100 |
| | | Remote EN 175301-803-A connector | **XS618B1MAL01C** | 0.100 |
| | | Remote M18 connector | **XS618B1MAL01G** | 0.100 |
| | NC | Pre-cabled (L = 2 m) *(2)* | **XS618B1MBL2** | 0.100 |
| | | 1/2"-20 UNF connector | **XS618B1MBU20** | 0.060 |
| | | Remote screw terminal connector | **XS618B1MBL01B** *(3)* | 0.100 |
| | | Remote EN 175301-803-A connector | **XS618B1MBL01C** | 0.100 |
| | | Remote M18 connector | **XS618B1MBL01G** | 0.100 |
| **Ø 30, threaded M30 x 1.5** | | | | |
| **15** | NO | Pre-cabled (L = 2 m) *(2)* | **XS630B1MAL2** | 0.205 |
| | | 1/2"-20 UNF connector | **XS630B1MAU20** | 0.145 |
| | | Remote screw terminal connector | **XS630B1MAL01B** *(3)* | 0.205 |
| | | Remote EN 175301-803-A connector | **XS630B1MAL01C** | 0.205 |
| | | Remote M18 connector | **XS630B1MAL01G** | 0.205 |
| | NC | Pre-cabled (L = 2 m) *(2)* | **XS630B1MBL2** | 0.205 |
| | | 1/2"-20 UNF connector | **XS630B1MBU20** | 0.145 |
| | | Remote screw terminal connector | **XS630B1MBL01B** *(3)* | 0.205 |
| | | Remote EN 175301-803-A connector | **XS630B1MBL01C** | 0.205 |

## Accessories *(4)*

| Description | For use with sensors | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

*(1) Ø8 plastic, double insulation version available (see page 64).*

*(2) For a 5 m cable replace L2 by **L5**; for a 10 m cable replace L2 by **L10**. Please consult our Customer Care Centre for availability.*
*Example: XS612B1MAL2 becomes **XS612B1MAL5** with a 5 m cable.*

*(3) Protective cable gland included with sensor.*

*(4) For more information, see page 118.*

# Inductive proximity sensors

## XS range, general purpose

Cylindrical, increased range, flush mountable
Two-wire AC or DC

## Characteristics

| Sensor type | | | XS6●●B1M●U20 | XS6●●B1M●L● |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | |
| **Connection** | Connector | | 1/2" - 20 UNF | – |
| | Pre-cabled | | – | Length 2 m |
| | Remote connector | | Screw terminal (L01B), EN 175301-803-A (L01C) and M18 (L01G) remote connectors on 0.15 m flying lead | |
| **Operating zone** *(1)* | 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, IP 67 | IP 65 and IP 68, double insulation ⧈ |
| | Conforming to DIN 40050 | | IP 69K | |
| **Storage temperature** | | °C | -40…+85 | |
| **Operating temperature** | | °C | -25…+70 | |
| **Materials** | Case | | Nickel plated brass | |
| | Sensing face | | PPS | |
| | 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: annular on pre-cabled version<br>Yellow LED with 4 viewing ports at 90° on connector version | |
| **Rated supply voltage** | | V | ≂ 24…240 (~ 50/60 Hz) | |
| **Voltage limits (including ripple)** | | V | ≂ 20…264 | |
| **Switching capacity** | **XS612B1M●●●** | mA | 5…200 *(2)* | |
| | **XS618B1M●●●**<br>**XS630B1M●●●** | mA | ∼ 5…300 or ⎓ 5…200 *(2)* | |
| **Voltage drop, closed state** | | V | ⩽ 5.5 | |
| **Residual current, open state** | | mA | ⩽ 0.8 | |
| **Maximum switching frequency** (DC/AC) | Ø 12 | Hz | ⎓ 1000 / ∼ 25 | |
| | Ø 18 | Hz | ⎓ 1000 / ∼ 25 | |
| | Ø 30 | Hz | ⎓ 500 / ∼ 25 | |
| **Delays** | First-up | ms | ⩽ 25 for Ø 18 and Ø 30; ⩽ 20 for Ø 12 | |
| | Response | ms | ⩽ 0.5 | |
| | Recovery | ms | ⩽ 0.2 for Ø 12; ⩽ 0.5 for Ø 18; ⩽ 2 for Ø 30 | |

*(1) Detection curves, see page 122.*
*(2) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.*

## Wiring schemes

**Connector** *(1)*

1/2"-20 UNF

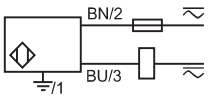
≂: 2
⏚: 1
≂: 3

**Pre-cabled**

BU: Blue
BN: Brown

**2-wire ∼ or ⎓**

**NO or NC output**

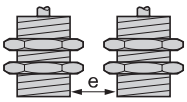


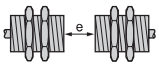

⏚: *on 1/2"-20UNF connector models only*

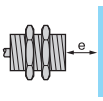
*(1) For pin arrangement of remote connectors L01B, L01C and L01G, see page 29.*

## Setting-up

**Minimum mounting distances (mm)**

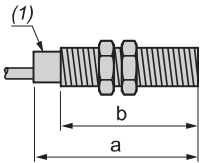



| Sensors | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 12 | e ⩾ 8 | e ⩾ 48 | e ⩾ 12 |
| Ø 18 | e ⩾ 16 | e ⩾ 100 | e ⩾ 25 |
| Ø 30 | e ⩾ 30 | e ⩾ 180 | e ⩾ 45 |

## Dimensions

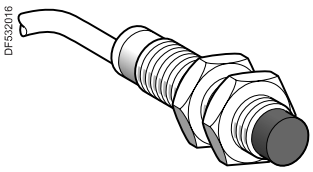



| Sensors | | Pre-cabled (mm) | | Connector (mm) | |
|---|---|---|---|---|---|
| | | a | b | a | b |
| Ø 12 | **XS612B1M●** | 53 | 42 | 61 | 42 |
| Ø 18 | **XS618B1M●** | 62 | 52 | 73 | 52 |
| Ø 30 | **XS630B1M●** | 62 | 52 | 73 | 52 |

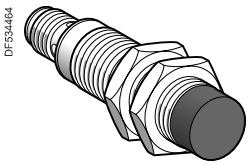
# Inductive proximity sensors

## XS range, general purpose

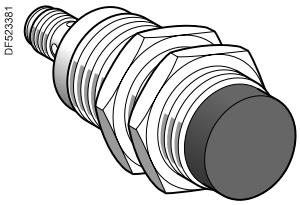
Cylindrical, increased range, non flush mountable
Three-wire DC, solid-state output



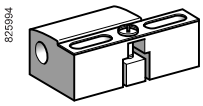

*XS612B4●●L2*




*XS618B4●●M12*




*XS630B5●●M12*




*XSZB●●●*

### Sensors, 3-wire ⎓ 12...48 V, long case model

**Ø 8, threaded M8 x 1**

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **4** | NO | PNP | Pre-cabled (L = 2 m) | **XS608B4PAL2** | 0.035 |
| | | | M8 connector | **XS608B4PAM8** | 0.015 |
| | | | M12 connector | **XS608B4PAM12** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) | **XS608B4NAL2** | 0.035 |
| | | | M8 connector | **XS608B4NAM8** | 0.015 |
| | | | M12 connector | **XS608B4NAM12** | 0.015 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS608B4PBL2** | 0.035 |
| | | | M8 connector | **XS608B4PBM8** | 0.015 |
| | | | M12 connector | **XS608B4PBM12** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) | **XS608B4NBL2** | 0.035 |
| | | | M8 connector | **XS608B4NBM8** | 0.015 |
| | | | M12 connector | **XS608B4NBM12** | 0.015 |

**Ø 12, threaded M12 x 1**

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **7** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS612B4PAL2** | 0.075 |
| | | | M12 connector | **XS612B4PAM12** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS612B4NAL2** | 0.075 |
| | | | M12 connector | **XS612B4NAM12** | 0.020 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS612B4PBL2** | 0.075 |
| | | | M12 connector | **XS612B4PBM12** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS612B4NBL2** | 0.075 |
| | | | M12 connector | **XS612B4NBM12** | 0.020 |

**Ø 18, threaded M18 x 1**

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **12** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS618B4PAL2** | 0.100 |
| | | | M12 connector | **XS618B4PAM12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS618B4NAL2** | 0.100 |
| | | | M12 connector | **XS618B4NAM12** | 0.040 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS618B4PBL2** | 0.100 |
| | | | M12 connector | **XS618B4PBM12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS618B4NBL2** | 0.100 |
| | | | M12 connector | **XS618B4NBM12** | 0.040 |

**Ø 30, threaded M30 x 1.5**

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **30** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS630B5PAL2** | 0.205 |
| | | | M12 connector | **XS630B5PAM12** | 0.145 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS630B5NAL2** | 0.205 |
| | | | M12 connector | **XS630B5NAM12** | 0.145 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1)* | **XS630B5PBL2** | 0.205 |
| | | | M12 connector | **XS630B5PBM12** | 0.145 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS630B5NBL2** | 0.205 |

### Accessories *(2)*

| Description | For use with sensors | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 8 | **XSZB108** | 0.004 |
| | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**. Please consult our Customer Care Centre for availability.*
*Example: XS612B4PAL2 becomes **XS612B4PAL5** with a 5 m cable.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

## XS range, general purpose

Cylindrical, increased range, non flush mountable
Three-wire DC, solid-state output

## Characteristics

| Sensor type | | | XS6●●B●●●M8 | XS6●●B●●●M12 | XS6●●B●●●L2 |
|---|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE, E2 | | |
| **Connection** | Connector | | M8 | M12 | – |
| | Pre-cabled | | – | | Length: 2 m |
| **Operating zone** | Ø 8 | **mm** | **0…3.2** | | |
| | Ø 12 | **mm** | **0…5.6** | | |
| | Ø 18 | **mm** | **0…9.6** | | |
| | Ø 30 | **mm** | **0…24** | | |
| **Differential travel** | | **%** | 1...15 of effective sensing distance (Sr) | | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 65 and IP 67 | | IP 65 and IP 68, double insulation ⧈ |
| | Conforming to DIN 40050 | | IP 69K | | – |
| **Storage temperature** | | **°C** | -40…+85 | | |
| **Operating temperature** | | **°C** | -25…+70 | | |
| **Materials** | Case | | Nickel plated brass, stainless steel grade 303 for XS608 | | |
| | Sensing face | | PPS | | |
| | Cable | | – | | PvR 3 x 0.34 mm² except for 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…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** | **XS608B4●●●●** and **XS612B4●●●●** | **Hz** | 2500 | | |
| | **XS618B4●●●●** | **Hz** | 1000 | | |
| | **XS630B5●●●●** | **Hz** | 500 | | |
| **Delays** | First-up | **ms** | ≤ 10 for Ø 8, Ø 12 and Ø 18; ≤ 15 for Ø 30 | | |
| | 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 Ø12; ≤ 0.7 for Ø 18; ≤ 1.4 for Ø 30 | | |

## Wiring schemes

### Connector

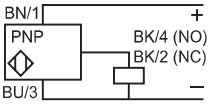
**M8**

**M12**

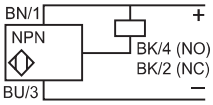
### Pre-cabled

BU: Blue
BN: Brown
BK: Black

### PNP

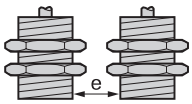


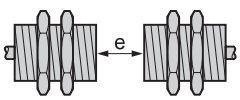

### NPN

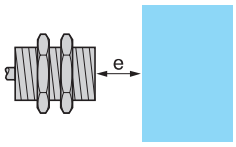


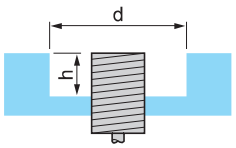

## Setting-up

### Minimum mounting distances (mm)



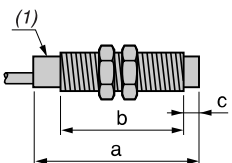




| | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| Ø 8 | e ≥ 24 | e ≥ 40 | e ≥ 12 | d ≥ 24, h ≥ 8 |
| Ø 12 | e ≥ 48 | e ≥ 84 | e ≥ 21 | d ≥ 36, h ≥ 12 |
| Ø 18 | e ≥ 72 | e ≥ 144 | e ≥ 36 | d ≥ 54, h ≥ 18 |
| Ø 30 | e ≥ 300 | e ≥ 300 | e ≥ 90 | d ≥ 90, h ≥ 35 |

## Dimensions



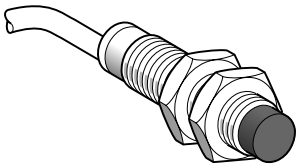

| XS6 | Pre-cabled (mm) | | | M8 Connector (mm) | | | M12 Connector (mm) | | |
|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | a | b | c | a | b | c |
| Ø 8 | 51 | 38 | 4 | 58 | 39 | 4 | 61 | 36 | 4 |
| Ø 12 | 54 | 42 | 5 | – | – | – | 66 | 42 | 5 |
| Ø 18 | 60 | 44 | 8 | – | – | – | 72 | 44 | 8 |
| Ø 30 | 66 | 41 | 13 | – | – | – | 74 | 41 | 13 |

# Inductive proximity sensors

## XS range, general purpose

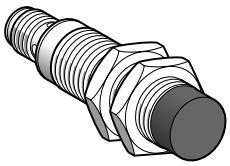
Cylindrical, increased range, non flush mountable
Three-wire DC, solid-state output

DF532016



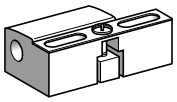
*XS212B4●●L●*

DF534464



*XS218B4●●M12*

8259942



*XSZB1●●*

### Sensors, 3-wire ⎓ 12-24 V, short case model

**Ø 12, threaded M12 x 1**

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **8** | NO | PNP | Pre-cabled (L = 2 m) | **XS212B4PAL2** | 0.086 |
| | | | Pre-cabled (L = 5 m) | **XS212B4PAL5** | 0.160 |
| | | | M12 connector | **XS212B4PAM12** | 0.032 |
| | | NPN | Pre-cabled (L = 2 m) | **XS212B4NAL2** | 0.086 |
| | | | M12 connector | **XS212B4NAM12** | 0.032 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS212B4PBL2** | 0.086 |
| | | | M12 connector | **XS212B4PBM12** | 0.032 |
| | | NPN | Pre-cabled (L = 2 m) | **XS212B4NBL2** | 0.086 |

**Ø 18, threaded M18 x 1**

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **16** | NO | PNP | Pre-cabled (L = 2 m) | **XS218B4PAL2** | 0.105 |
| | | | Pre-cabled (L = 5 m) | **XS218B4PAL5** | 0.190 |
| | | | M12 connector | **XS218B4PAM12** | 0.052 |
| | | NPN | Pre-cabled (L = 2 m) | **XS218B4NAL2** | 0.105 |
| | | | M12 connector | **XS218B4NAM12** | 0.052 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS218B4PBL2** | 0.105 |
| | | | M12 connector | **XS218B4PBM12** | 0.052 |

### Accessories *(1)*

| Description | For use with sensors | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |

*(1) For further information, see page 118.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

XS range, general purpose

Cylindrical, increased range, non flush mountable

Three-wire DC, solid-state output

## Characteristics

| Sensor type | | | XS21●B4●●M12 | XS21●B4●●L● |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE, E2 | |
| **Connection** | Connector | | M12 | – |
| | Pre-cabled | | – | Length: 2 or 5 m |
| **Operating zone** | Ø 12 | **mm** | **0…6.4** | |
| | Ø 18 | **mm** | **0…12.8** | |
| **Differential travel** | | **%** | 1…15 of effective sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 65 and IP 67 | |
| | Conforming to DIN 40050 | | IP 69K | |
| **Storage temperature** | | **°C** | - 40…+ 85 | |
| **Operating temperature** | | **°C** | - 25…+ 70 | |
| **Materials** | Case | | Brass | |
| | Sensing face | | PPS | |
| | 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…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** | **XS212B4●●●●** | **Hz** | 2000 | |
| | **XS218B4●●●●** | **Hz** | 1000 | |
| **Delays** | First-up | **ms** | ⩽ 15 | |
| | Response | **ms** | ⩽ 0.2 for Ø 12<br>⩽ 0.3 for Ø 18 | |
| | Recovery | **ms** | ⩽ 0.2 for Ø 12<br>⩽ 0.7 for Ø 18 | |

## Wiring schemes

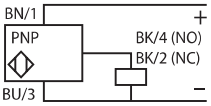
**Connector**

M12

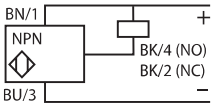
**Pre-cabled**

BU: Blue
BN: Brown
BK: Black

**PNP**

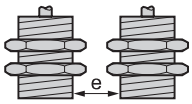


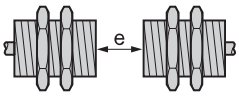

**NPN**

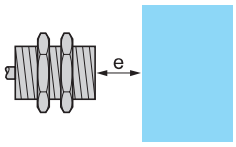


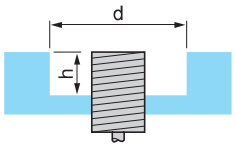

## Setting-up

**Minimum mounting distances (mm)**



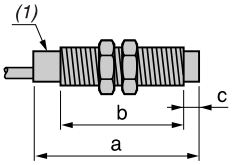




| | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| Ø 12 | e ⩾ 100 | e ⩾ 120 | e ⩾ 24 | d ⩾ 36, h ⩾ 15 |
| Ø 18 | e ⩾ 120 | e ⩾ 200 | e ⩾ 48 | d ⩾ 54, h ⩾ 18 |

## Dimensions




| | **Pre-cabled** (mm) | | | **M12 connector** (mm) | | |
|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **a** | **b** | **c** |
| Ø 12 | 37 | 20 | 5 | 51 | 26 | 5 |
| Ø 18 | 41 | 21 | 8 | 51 | 21 | 8 |

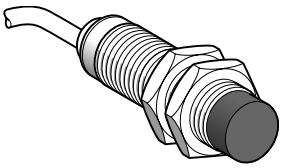
*(1) LED*

# Inductive proximity sensors

## XS range, general purpose

Cylindrical, increased range, non flush mountable
Two-wire AC or DC

822109



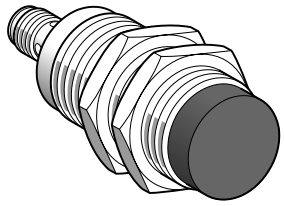
*XS6●●B4M●L2*

### Sensors, 2-wire ≂ 24... 240 V, long case model

**Ø 18, threaded M18 x 1**

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **12** | NO | Pre-cabled (L = 2 m) *(1)* | **XS618B4MAL2** | 0.120 |
| | | 1/2”-20 UNF connector | **XS618B4MAU20** | 0.060 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS618B4MBL2** | 0.120 |
| | | 1/2”-20 UNF connector | **XS618B4MBU20** | 0.060 |

523381

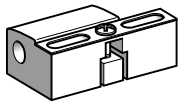


*XS6●●B4M●U20*

**Ø 30, threaded M30 x 1.5**

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **22** | NO | Pre-cabled (L = 2 m) *(1)* | **XS630B4MAL2** | 0.205 |
| | | 1/2”-20 UNF connector | **XS630B4MAU20** | 0.145 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS630B4MBL2** | 0.205 |
| | | 1/2”-20 UNF connector | **XS630B4MBU20** | 0.145 |

825994



*XSZB1●●*

### Accessories *(2)*

| Description | For use with sensors | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

*(1) For a 5 m cable replace L2 by **L5**; for a 10 m cable replace L2 by **L10**.*
*Example: XS618B4MAL2 becomes **XS618B4MAL5** with a 5 m cable.*
*(2) For more information, see page 118.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

## XS range, general purpose

Cylindrical, increased range, non flush mountable
Two-wire AC or DC

## Characteristics

| Sensor type | | | XS6●●B4M●U20 | XS6●●B4M●L2 |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | |
| **Connection** | Connector | | 1/2"-20 UNF | – |
| | 1/2"-20 UNFPre-cabled | | – | Length: 2 m |
| **Operating zone** | Ø 18 | **mm** | **0…9.6** | |
| | Ø 30 | **mm** | **0...17.6** | |
| **Differential travel** | | **%** | 1...15 of effective sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 65 and IP 67 | IP 65 and IP 68, double insulation ⧈ |
| **Storage temperature** | | **°C** | -40…+85 | |
| **Operating temperature** | | **°C** | -25…+70 | |
| **Materials** | Case | | Nickel plated brass | |
| | Sensing face | | PPS | |
| | 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** | **XS618B4M●●●** | **Hz** | ∼ 25 or ⎓ 1000 | |
| | **XS630B4M●●●** | **Hz** | ∼ 25 or ⎓ 300 | |
| **Delays** | First-up | **ms** | ⩽ 30 **XS618B4M●●●** and **XS630B4M●●●** | |
| | Response | **ms** | ⩽ 0.5 | |
| | Recovery | **ms** | ⩽ 0.5 **XS618B4M●●●**, ⩽ 2 **XS630B4M●●●** | |

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

## Wiring schemes

**Connector**

1/2"-20 UNF

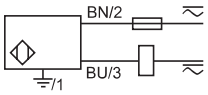
⎓: 2
⏚: 1
⎓: 3

**Pre-cabled**

BU: Blue
BN: Brown

**2-wire ∼ or ⎓**

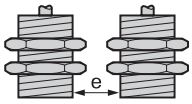
**NO or NC output**

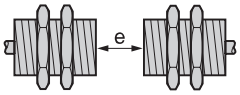


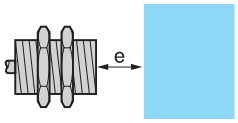

*⏚: on connector models only*

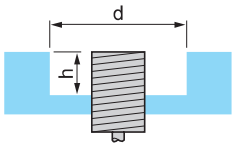
## Setting-up

**Minimum mounting distances (mm)**



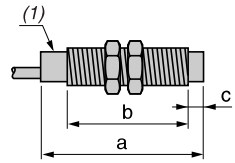




| | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| Ø 18 | e ⩾ 72 | e ⩾ 144 | e ⩾ 36 | d ⩾ 54, h ⩾ 18 |
| Ø 30 | e ⩾ 120 | e ⩾ 264 | e ⩾ 66 | d ⩾ 90, h ⩾ 30 |

## Dimensions




| | Pre-cabled (mm) | | | Connector (mm) | | |
|---|---|---|---|---|---|---|
| | a | b | c | a | b | c |
| Ø 18 | 60 | 44 | 8 | 72 | 44 | 8 |
| Ø 30 | 63 | 41 | 13 | 74 | 41 | 13 |

*(1) LED*

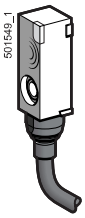
# Inductive proximity sensors

## XS range, general purpose, standard range

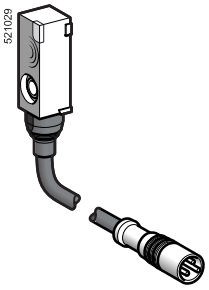
Flat format, flush mountable

Two-wire DC

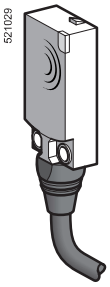
Three-wire DC, solid-state output



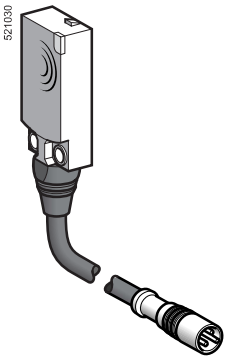

*XS7J1A1●●L2*




*XS7J1A1●●L01M8*




*XS7F1A1●●L2*




*XS7F1A1●●L01M8*

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

**Three-wire ⎓**

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) *(3)* | **XS7J1A1PAL2** | 0.060 |
| | | | Remote M8 connector on 0.15 m flying lead | **XS7J1A1PAL01M8** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS7J1A1NAL2** | 0.060 |
| | | | Remote M8 connector on 0.15 m flying lead | **XS7J1A1NAL01M8** | 0.040 |
| | NC | PNP | Pre-cabled (L = 2 m) *(3)* | **XS7J1A1PBL2** | 0.060 |
| | | | Remote M8 connector on 0.15 m flying lead | **XS7J1A1PBL01M8** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS7J1A1NBL2** | 0.060 |
| | | | Remote M8 connector on 0.15 m flying lead | **XS7J1A1NBL01M8** | 0.040 |

**Two-wire ⎓**

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **2.5** | NO | | Pre-cabled (L = 2 m) *(3)* | **XS7J1A1DAL2** | 0.050 |
| | | | Remote M8 connector on 0.15 m flying lead | **XS7J1A1DAL01M8** | 0.035 |
| | NC | | Pre-cabled (L = 2 m) *(3)* | **XS7J1A1DBL2** | 0.050 |
| | | | Remote M8 connector on 0.15 m flying lead | **XS7J1A1DBL01M8** | 0.035 |

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

**Three-wire ⎓**

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **5** | NO | PNP | Pre-cabled (L = 2 m) *(3)* | **XS7F1A1PAL2** | 0.065 |
| | | | Remote M8 connector on 0.15 m flying lead | **XS7F1A1PAL01M8** | 0.045 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS7F1A1NAL2** | 0.065 |
| | | | Remote M8 connector on 0.15 m flying lead | **XS7F1A1NAL01M8** | 0.045 |
| | NC | PNP | Pre-cabled (L = 2 m) *(3)* | **XS7F1A1PBL2** | 0.065 |
| | | | Remote M8 connector on 0.15 m flying lead | **XS7F1A1PBL01M8** | 0.045 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS7F1A1NBL2** | 0.065 |
| | | | Remote M8 connector on 0.15 m flying lead | **XS7F1A1NBL01M8** | 0.045 |

**Two-wire ⎓**

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **5** | NO | | Pre-cabled (L = 2 m) *(3)* | **XS7F1A1DAL2** | 0.055 |
| | | | Remote M8 connector on 0.15 m flying lead | **XS7F1A1DAL01M8** | 0.045 |
| | NC | | Pre-cabled (L = 2 m) *(3)* | **XS7F1A1DBL2** | 0.055 |
| | | | Remote M8 connector on 0.15 m flying lead | **XS7F1A1DBL01M8** | 0.045 |

*(1) For accessories, see page 118.*
*(2) Sensors **XS7J** include a fixing clamp with screw.*
*(3) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS7J1A1PAL2** becomes **XS7J1A1PAL5** with a 5 m long cable.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

XS range, general purpose, standard range
Flat format, flush mountable
Two-wire DC
Three-wire DC, solid-state output

## Characteristics

| Sensor type | | | XS7J●●●●●L01M8 | XS7F●●●●●L01M8 | XS7J●●●●●●L2, XS7F●●●●●●L2 |
|---|---|---|---|---|---|
| **Product certifications** | | | CE | UL, CSA, CE | |
| **Connection** | Connector | | Remote M8 connector on 0.15 m flying lead | | – |
| | Pre-cabled | | – | | Length: 2 m |
| **Operating zone** | **XS7J** | **mm** | **0…2** | | |
| | **XS7F** | **mm** | **0…4** | | |
| **Differential travel** | | **%** | 1...15 of effective sensing distance (Sr) | | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 (**XS7J**), IP 68 (**XS7F**) | | |
| **Storage temperature** | | **°C** | - 40….+ 85 | | |
| **Operating temperature** | | **°C** | - 25….+ 70 | | |
| **Materials** | Case | | PBT | | |
| | Cable | | PvR 3 x 0.11 mm² or 2 x 0.11 mm² (XS7F: 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 **XS7J,** 5 for **XS7F** | | |
| **Delays** | First-up | **ms** | Three-wire: 5 | | |
| | | **ms** | Two-wire: 10 **XS7J**, 5 **XS7F** | | |
| | Response | **ms** | Three-wire: 0,1 | | |
| | | **ms** | Two-wire: 0,5 **XS7J**, 5 **XS7F** | | |
| | Recovery | **ms** | Three-wire: 0,1 | | |
| | | **ms** | Two-wire: 1 **XS7J**, 5 **XS7F** | | |

## Wiring schemes

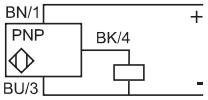
### Connector

M8

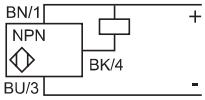
### Pre-cabled

BU: Blue
BN: Brown
BK: Black

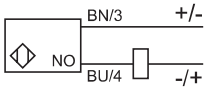
### PNP NO or NC



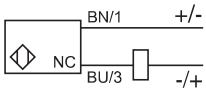

### NPN NO or NC




### 2-wire NO

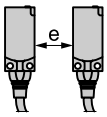


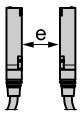

### 2-wire NC

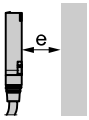



## Setting-up

### Minimum mounting distances (mm)



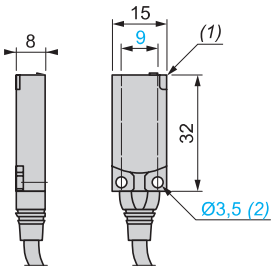



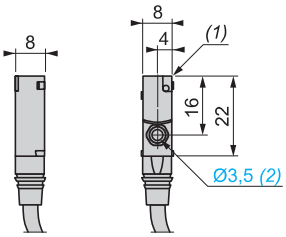

| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| **XS7J** | e ≥ 7.5 | e ≥ 20 | e ≥ 7.5 |
| **XS7F** | e ≥ 15 | e ≥ 40 | e ≥ 15 |

## Dimensions

### XS7F




### XS7J

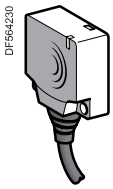


# Inductive proximity sensors

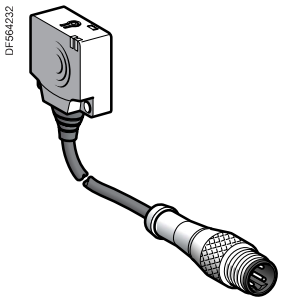
## XS range, general purpose, standard range

Flat format, flush mountable
Two-wire DC
Three-wire DC, solid-state output

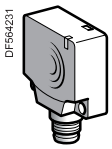
ECOLAB certified



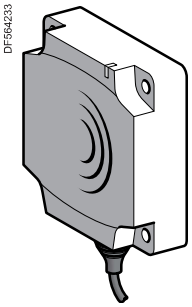

XS7E1A1●●L2



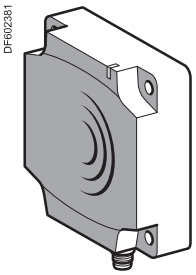

XS7●1A1●L0●M12



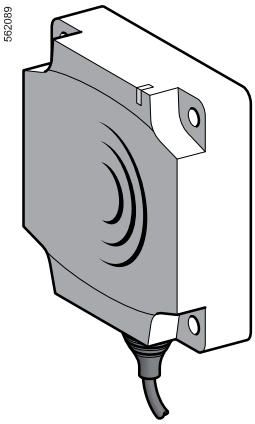

XS7E1A1●●M8



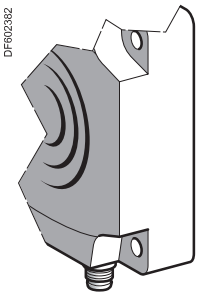

XS7C1A1●●L2



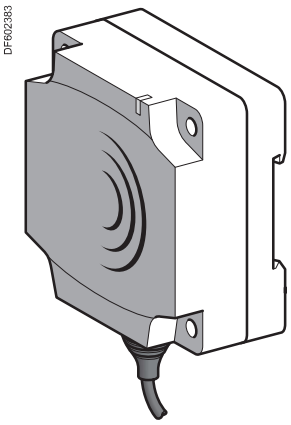

XS7C1A1●●M8



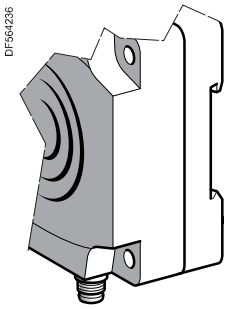

XS7D1A1●●L2




XS7D1A1●●M12




XS7D1A1●●L2DIN




XS7D1A1●●M12DIN

| Sens. dist. (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Flat, 26 x 26 x 13 mm format** *(1)* | | | | | |
| **Three-wire ⎓** | | | | | |
| **10** | NO | PNP | Pre-cabled (L = 2 m) *(4)* | **XS7E1A1PAL2** | 0.075 |
| | | | M8 connector | **XS7E1A1PAM8** | 0.040 |
| | | | Remote M12 connector | **XS7E1A1PAL01M12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(4)* | **XS7E1A1NAL2** | 0.075 |
| | | | M8 connector | **XS7E1A1NAM8** | 0.075 |
| | | | Remote M12 connector | **XS7E1A1NAL01M12** | 0.040 |
| | NC | PNP | Pre-cabled (L = 2 m) *(4)* | **XS7E1A1PBL2** | 0.075 |
| | | | M8 connector | **XS7E1A1PBM8** | 0.040 |
| | | | Remote M12 connector | **XS7E1A1PBL01M12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(4)* | **XS7E1A1NBL2** | 0.075 |
| | | | M8 connector | **XS7E1A1NBM8** | 0.040 |
| | | | Remote M12 connector | **XS7E1A1NBL01M12** | 0.040 |
| **Two-wire ⎓** | | | | | |
| **10** | NO | | Pre-cabled (L = 2 m) *(4)* | **XS7E1A1DAL2** | 0.070 |
| | | | M8 connector | **XS7E1A1DAM8** | 0.040 |
| | | | Remote M12 connector | **XS7E1A1DAL01M12** | 0.040 |
| | NO terminals 1 and 4 *(2)* | | Remote M12 connector | **XS7E1A1CAL01M12** | 0.040 |
| | | | Remote M12 connector *(3)* | **XS7E1A1CAL08M12** | 0.065 |
| | NC | | Pre-cabled (L = 2 m) *(4)* | **XS7E1A1DBL2** | 0.070 |
| | | | M8 connector | **XS7E1A1DBM8** | 0.040 |
| | | | Remote M12 connector | **XS7E1A1DBL01M12** | 0.040 |
| **Flat, 40 x 40 x 15 mm format** *(1)* | | | | | |
| **Three-wire ⎓** | | | | | |
| **15** | NO | PNP | Pre-cabled (L = 2 m) *(4)* | **XS7C1A1PAL2** | 0.095 |
| | | | M8 connector | **XS7C1A1PAM8** | 0.060 |
| | | | Remote M12 connector | **XS7C1A1PAL01M12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(4)* | **XS7C1A1NAL2** | 0.095 |
| | | | M8 connector | **XS7C1A1NAM8** | 0.060 |
| | | | Remote M12 connector | **XS7C1A1NAL01M12** | 0.060 |
| | NC | PNP | Pre-cabled (L = 2 m) *(4)* | **XS7C1A1PBL2** | 0.095 |
| | | | M8 connector | **XS7C1A1PBM8** | 0.060 |
| | | | Remote M12 connector | **XS7C1A1PBL01M12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(4)* | **XS7C1A1NBL2** | 0.095 |
| | | | M8 connector | **XS7C1A1NBM8** | 0.060 |
| | | | Remote M12 connector | **XS7C1A1NBL01M12** | 0.060 |
| **Two-wire ⎓** | | | | | |
| **15** | NO | | Pre-cabled (L = 2 m) *(4)* | **XS7C1A1DAL2** | 0.090 |
| | | | M8 connector | **XS7C1A1DAM8** | 0.060 |
| | | | Remote M12 connector | **XS7C1A1DAL01M12** | 0.060 |
| | NO terminals 1 and 4 *(2)* | | Remote M12 connector | **XS7C1A1CAL01M12** | 0.060 |
| | | | Remote M12 connector *(3)* | **XS7C1A1CAL08M12** | 0.090 |
| | NC | | Pre-cabled (L = 2 m) *(4)* | **XS7C1A1DBL2** | 0.090 |
| | | | M8 connector | **XS7C1A1DBM8** | 0.060 |
| | | | Remote M12 connector | **XS7C1A1DBL01M12** | 0.060 |
| **Flat, 80 x 80 x 26 mm format** *(1)* | | | | | |
| **Three-wire ⎓** | | | | | |
| **40** | NO | PNP | Pre-cabled (L = 2 m) *(4)* | **XS7D1A1PAL2** *(5)* | 0.340 |
| | | | M12 connector | **XS7D1A1PAM12** *(5)* | 0.290 |
| | | NPN | Pre-cabled (L = 2 m) *(4)* | **XS7D1A1NAL2** *(5)* | 0.340 |
| | | | M12 connector | **XS7D1A1NAM12** *(5)* | 0.290 |
| | NC | PNP | Pre-cabled (L = 2 m) *(4)* | **XS7D1A1PBL2** *(5)* | 0.340 |
| | | | M12 connector | **XS7D1A1PBM12** *(5)* | 0.290 |
| | | NPN | Pre-cabled (L = 2 m) *(4)* | **XS7D1A1NBL2** *(5)* | 0.340 |
| | | | M12 connector | **XS7D1A1NBM12** *(5)* | 0.290 |
| **Two-wire ⎓** | | | | | |
| **40** | NO | | Pre-cabled (L = 2 m) *(4)* | **XS7D1A1DAL2** *(5)* | 0.340 |
| | | | M12 connector | **XS7D1A1DAM12** *(5)* | 0.290 |
| | NO terminals 1 and 4 *(2)* | | M12 connector | **XS7D1A1CAM12** *(5)* | 0.290 |
| | NC | | Pre-cabled (L = 2 m) *(4)* | **XS7D1A1DBL2** *(5)* | 0.340 |
| | | | M12 connector | **XS7D1A1DBM12** *(5)* | 0.290 |

*(1) For accessories, see page 118.*
*(2) The NO output is connected to terminals 1 and 4 of the M12 connector.*
*(4) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **S7 J1A1PAL2** becomes **XS7J1A1PAL5** 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*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

XS range, general purpose, standard range
Flat format, flush mountable
Two-wire DC
Three-wire DC, solid-state output

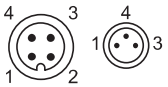
## Characteristics

| Sensor type | | | | XS7E●●●●●M8, XS7C●●●●●M8, XS7D●●●●●M12 | XS7E●●●●●L01M12, XS7C●●●●●L01M12 | XS7E●●●●●L2, XS7C●●●●●L2, XS7D●●●●●L2 |
|---|---|---|---|---|---|---|
| **Product certifications** | | | | UL, CSA, CE, ECOLAB | | |
| **Connection** | Connector | | | M8 except M12 on **XS7D●●●●●M12** | M12 on 0.15 m flying lead for **XS7●●●●●L01M12** | – |
| | Pre-cabled | | | – | – | Length: 2 m |
| **Operating zone** | **XS7E** | | **mm** | **0…8** | | |
| | **XS7C** | | **mm** | **0…12** | | |
| | **XS7D** | | **mm** | **0…32** | | |
| **Differential travel** | | | **%** | 1...15 of effective sensing distance (Sr) | | |
| **Degree of protection** | Conforming to IEC 60529 | | | IP 67, double insulation ⧈ (except for M8 connector: IP 67) | | IP 68, ⧈ |
| **Storage temperature** | | | **°C** | - 40….+ 85 | | |
| **Operating temperature** | | | **°C** | - 25….+ 70 | | |
| **Materials** | Case | | | PBT | | |
| | Cable | | | – | 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** | **XS7E, XS7C** | | **kHz** | 1 | | |
| | **XS7D** | | **Hz** | 100 | | |
| **Delays** | First-up | 3-wire | **ms** | 10 **XS7E** and **XS7C**, 30 **XS7D** | | |
| | | 2-wire | **ms** | 5 **XS7E** and **XS7D**, 10 **XS7D** | | |
| | Response | 3-wire | **ms** | 2 **XS7E** and **XS7C**, 5 **XS7D** | | |
| | | 2-wire | **ms** | 0,3 **XS7E** and **XS7D**, 10 **XS7D** | | |
| | Recovery | 3-wire | **ms** | 6 **XS7E**, 5 **XS7C**, 35 **XS7D** | | |
| | | 2-wire | **ms** | 0,7 **XS7E** and **XS7D**, 10 **XS7D** | | |

## Wiring schemes

### Connector

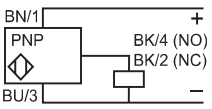
M12 M8



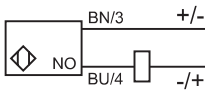

### Pre-cabled

BU: Blue
BN: Brown
BK: Black

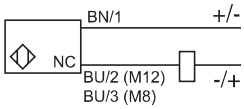
### PNP *(1)*



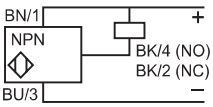

### 2-wire NO/M12 or M8



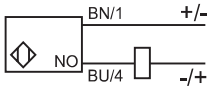

### 2-wire NC/M12 or M8




### NPN *(1)*




### 2-wire NO/M12 XS7●●●●CA●●●

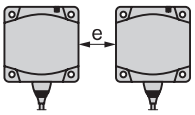



*(1) For M8 connector, NO and NC outputs on terminal 4*

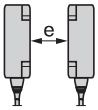
## Setting-up

### Minimum mounting distances (mm)

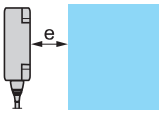
| Side by side | e ≥ | XS7E | XS7C | XS7D |
|---|---|---|---|---|
| | | 30 | 45 | 120 |




| Face to face | e ≥ | XS7E | XS7C | XS7D |
|---|---|---|---|---|
| | | 72 | 110 | 300 |

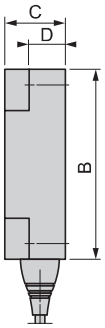



| Facing a metal object | e ≥ | XS7E | XS7C | XS7D |
|---|---|---|---|---|
| | | 30 | 45 | 120 |

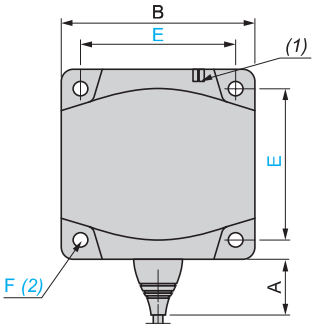



## Dimensions

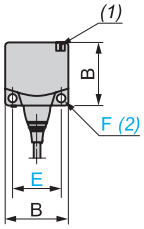
### XS7C/D/E




### XS7C/D




### XS7E




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

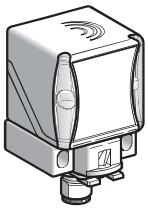
| Sensor | A (cable) | A (connector) | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| **XS7E** | 14 | 11 | 26 | 13 | 8.8 | **20** | **3.5** |
| **XS7C** | 14 | 11 | 40 | 15 | 9.8 | **33** | **4.5** |
| **XS7D** | 23 | 18 | 80 | 26 | 16 | **65** | **5.5** |

# Inductive proximity sensors

## XS range, general purpose

Cubic case, 40 x 40 x 70 mm, M12 or 1/2”-20UNF connector

5 position turret head

| Sensor | | | Flush mountable in metal | | Non flush mountable in metal |
|---|---|---|---|---|---|
| | | |  | | |
| **Nominal sensing distance (Sn)** | | | 15 mm | 20 mm | 40 mm |
| **References** | | | | | |
| **4-wire ⎓** | PNP | NO+NC | – | **XS8C2A1PCM12** | **XS8C2A4PCM12** |
| | NPN | NO+NC | – | **XS8C2A1NCM12** | **XS8C2A4NCM12** |
| **3-wire ⎓** | PNP | NO | **XS7C2A1PAM12** | – | – |
| | NPN | NO | **XS7C2A1NAM12** | – | – |
| | PNP | NC | **XS7C2A1PBM12** | – | – |
| | NPN | NC | **XS7C2A1NBM12** | – | – |
| **2-wire ⎓** | NO | | **XS7C2A1DAM12** | **XS8C2A1DAM12** | **XS8C2A4DAM12** |
| | NC | | **XS7C2A1DBM12** | **XS8C2A1DBM12** | **XS8C2A4DBM12** |
| **2-wire (∿/⎓) unprotected** *(1)* | NO | | **XS7C2A1MAU20** | **XS8C2A1MAU20** | **XS8C2A4MAU20** |
| | NC | | **XS7C2A1MBU20** | **XS8C2A1MBU20** | **XS8C2A4MBU20** |
| **Weight (kg)** | | | 0.149 | 0.149 | 0.149 |
| **Characteristics** | | | | | |
| **Operating zone** | | | 0…12 mm | 0…16 mm | 0…32 mm |
| **Product certifications** | | | UL, CSA, CE, TÜV (4-wire), E2 ( 3-wire and 4-wire) | | |
| **Conformity to standards** | | | IEC 60947-5-2 | | |
| **Conformity to safety standards** *(2)* | For XS8C2A●PCM12 | | EN 62061 (2005): SILcl2<br>EN 61508 (2010): SIL 2,<br>EN ISO 13849 (2008): PL d | | |
| **Reliability data** *(2)* | For XS8C2A●PCM12 | | MTTFd = 1546 years<br>PFHd = 7.4 10-8 1/h | | |
| **Connection** | | | M12 connector for ⎓ versions<br>1/2 "-20UNF connector for ∿/⎓ versions | | |
| **Differential travel** | | | 3…15% of Sr | | |
| **Degree of protection** | Conforming to IEC 60529 and DIN 40050 | | IP 65, IP 67 and IP 69K | | |
| **Temperature** | Storage | | - 40….+ 85°C | | |
| | Operation *(3)* | | - 25….+ 70°C | | |
| **Material** | | | Case: PBT | | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10…55 Hz) | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn for 11 ms | | |
| **Indicators** | Output state | | Yellow LED | | |
| | Power on | | Green LED, for 4-wire ⎓, 3-wire ⎓ and 2-wire ∿/⎓ versions | | |
| **Rated supply voltage** | 4-wire ⎓ | | 12…48 V with protection against reverse polarity | | |
| | 3-wire ⎓ | | 12…24 V with protection against reverse polarity | | |
| | 2-wire ⎓ | | 12…48 V with protection against reverse polarity | | |
| | 2-wire ∿/⎓ | | 24…240 V (∿ 50/60 Hz) | | |
| **Voltage limits (including ripple)** | 4-wire ⎓ | | 10…58 V | | |
| | 3-wire ⎓ | | 10…36 V | | |
| | 2-wire ⎓ | | 10…58 V | | |
| | 2-wire ∿/⎓ | | 20…264 V | | |
| **Current consumption, no-load** | 3-wire and 4-wire ⎓ | | < 15 mA | | |
| **Residual current, open state** | 2-wire ⎓ | | < 0.6 mA | | |
| | 2-wire ∿/⎓ | | 1.5 mA | | |
| **Switching capacity** | 3-wire and 4-wire ⎓ | | < 200 mA with overload and short-circuit protection | | |
| | 2-wire ⎓ | | < 100 mA with overload and short-circuit protection | | |
| | 2-wire ∿/⎓ | | ∿: 5…300 mA *(1)*<br>⎓: 5…200 mA *(1)* | | |
| **Voltage drop, closed state** | 3-wire and 4-wire ⎓ | | < 2 V | | |
| | 2-wire ⎓ | | < 4.2 V | | |
| | 2-wire ⎓/∿ | | < 5.5 V | | |
| **Maximum switching frequency** | | | Flush mountable: ⎓ 300 Hz, ∿ 25 Hz<br>Non flush mountable: ⎓ 150 Hz, ∿ 25 Hz | | |
| **Delays** | First-up | | 7 ms (3-wire and 4-wire ⎓), 20 ms (2-wire ⎓ and 2-wire ⎓/∿) | | |
| | Response | | Flush mountable: ≤ 1.2 ms. Non flush mountable: ≤ 1.4 ms | | |
| | Recovery | | Flush mountable: ≤ 1.8 ms. Non flush mountable: ≤ 3.5 ms | | |

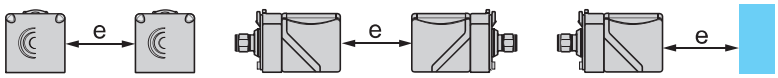
*(1) Sensor must be protected by a 0.4 A quick-blow fuse (reference **XUZE04**) connected in series with the load.*
*(2) SIL 2 protection can only be obtained by connecting both outputs to a safety PLC.*
*(3) Sensors are available for very low temperatures (suffix **TF**: - 40°C, + 70°C) or very high temperatures (suffix **TT**: - 25°C, + 85°C). Please consult our Customer*

# Inductive proximity sensors

XS range, general purpose
Cubic case, 40 x 40 x 70 mm, M12 or 1/2”-20UNF connector
5 position turret head

## Setting-up precautions

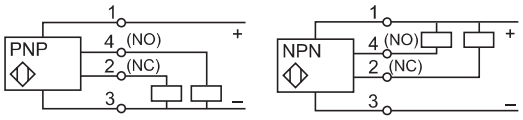
### Minimum mounting distances (mm)



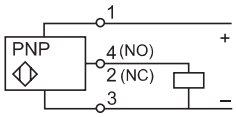

| | | Side by side | Face to face | Facing a metal object |
|---|---|---|---|---|
| **Sensors flush mountable in metal** | **XS7C2A1●●** | e ⩾ 60 | e ⩾ 120 | e ⩾ 45 |
| | **XS8C2A1●●** | e ⩾ 80 | e ⩾ 160 | e ⩾ 60 |
| **Sensors non flush mountable in metal** | **XS8C2A4●●** | e ⩾ 160 | e ⩾ 320 | e ⩾ 120 |

## Wiring schemes

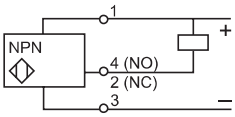
**4-wire ⎓, NO + NC outputs**



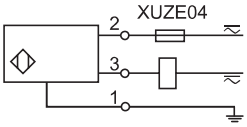

**3-wire, PNP**



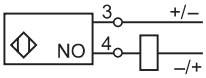

**3-wire, NPN**



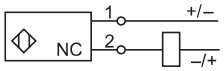

**2-wire, 1/2”- 20UNF**




**2-wire ⎓, NO output** (M12 connector)




**2-wire ⎓, NC output** (M12 connector)




**M12 connector**

+ V: 1
NC: 2
- V: 3
NO: 4

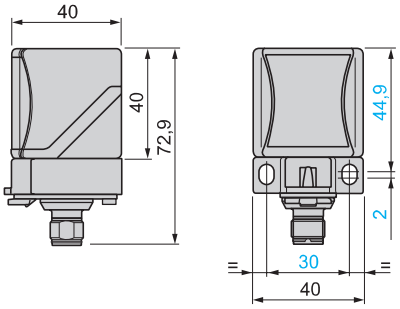
**1/2”-20UNF connector**

⎓: 2
⏚: 1
⎓: 3

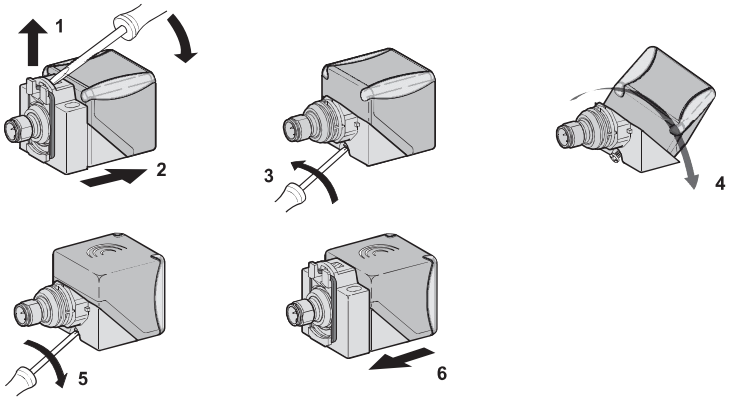
## Accessory references

| Description | Type | Length m | Reference | Weight kg |
|---|---|---|---|---|
| **Pre-wired M12 connectors** Female, 4-pin, zinc die-cast, nickel plated clamping ring | Straight | 2 | **XZCP1141L2** | 0.090 |
| | | 5 | **XZCP1141L5** | 0.190 |
| | | 10 | **XZCP1141L10** | 0.370 |
| | Elbowed | 2 | **XZCP1241L2** | 0.090 |
| | | 5 | **XZCP1241L5** | 0.190 |
| | | 10 | **XZCP1241L10** | 0.370 |
| **Pre-wired 1/2”-20UNF connectors** Female, 3-pin, zinc die-cast, nickel plated clamping ring | Straight | 5 | **XZCP1865L5** | 0.180 |
| | | 10 | **XZCP1865L10** | 0.350 |
| | Elbowed | 5 | **XZCP1965L5** | 0.180 |
| | | 10 | **XZCP1965L10** | 0.350 |

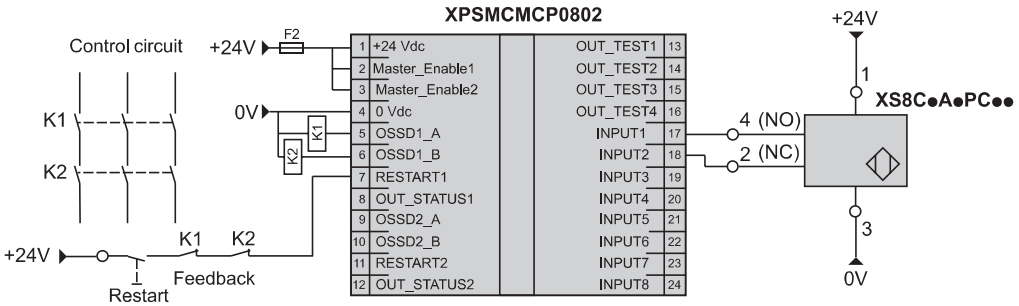
## Dimensions




## Head positions




## Example SIL 2 wiring scheme (with XPSMCMCP0802 safety PLC)

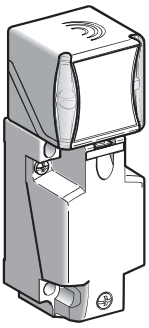



**SFF** (Safe Failure Fraction): 92,68 %
**DC** (Diagnosis Coverage): 75,8 %

# Inductive proximity sensors

## XS range, general purpose

Plastic case, 40 x 40 x 117 mm, plug-in
5 position turret head

| Sensor | | | Flush mountable in metal | | Non flush mountable in metal |
|---|---|---|---|---|---|
| | | |  | | |
| **Nominal sensing distance (Sn)** | | | 15 mm | 20 mm | 40 mm |
| **References** | | | | | |
| **4-wire ⎓** | PNP | NO+NC | – | **XS8C4A1PCP20** | **XS8C4A4PCP20** |
| | NPN | NO+NC | – | **XS8C4A1NCP20** | **XS8C4A4NCP20** |
| **2-wire ⎓** | NO or NC programmable | | **XS7C4A1DPP20** | **XS8C4A1DPP20** | **XS8C4A4DPP20** |
| **2-wire (∿/⎓) unprotected** *(1)* | NO or NC programmable | | **XS7C4A1MPP20** | **XS8C4A1MPP20** | **XS8C4A4MPP20** |
| **Weight (kg)** | | | 0.244 | 0.244 | 0.244 |
| | | | ***Note**: These sensors have an M20 cable entry. They can also be supplied with a PG 13.5 cable entry (e.g. **XS8C4A4PCG13**) or a 1/2" NPT cable entry (e.g. **XS8C4A1MPN12**). Please consult our Customer Care Centre.* | | |
| **Characteristics** | | | | | |
| **Operating zone** | | | 0…12 mm | 0…16 mm | 0…32 mm |
| **Product certifications** | | | UL, CSA, CE, TÜV (4-wire), E2 (4-wire) | | |
| **Conformity to standards** | | | IEC 60947-5-2 | | |
| **Conformity to safety standards** *(2)* | For XS8C4A●PCP20 | | EN 62061 (2005): SILcl2,<br>EN 61508 (2010): SIL 2,<br>EN ISO 13849 (2008): PL d | | |
| **Reliability data** *(2)* | For XS8C4A●PCP20 | | MTTFd = 1546 years<br>PFHd = 7.4 10-8 1/h | | |
| **Connection** | | | Screw terminals, clamping capacity: 2 or 4 x 1.5 mm2 / 2 or 4 x 16 AWG *(3)* | | |
| **Differential travel** | | | 3…15% of Sr | | |
| **Degree of protection** | Conforming to IEC 60529 and DIN 40050 | | IP 65, IP 67 and IP 69K | | |
| **Temperature** | Storage | | - 40….+ 85°C | | |
| | Operation *(4)* | | - 25….+ 70°C | | |
| **Material** | | | Case: PBT | | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 2 mm (f = 10…55 Hz) | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 50 gn for 11 ms | | |
| **Indicators** | Output state | | Yellow LED | | |
| | Power on | | Green LED, for 4-wire ⎓ and 2-wire ∿/⎓ versions | | |
| **Rated supply voltage** | 4-wire ⎓ | | 12…48 V with protection against reverse polarity | | |
| | 2-wire ⎓ | | 12…48 V with protection against reverse polarity | | |
| | 2-wire ∿/⎓ | | 24…240 V (∿ 50/60 Hz) | | |
| **Voltage limits (including ripple)** | 4-wire ⎓ | | 10…58 V | | |
| | 2-wire ⎓ | | 10…58 V | | |
| | 2-wire ∿/⎓ | | 20…264 V | | |
| **Current consumption, no-load** | 4-wire ⎓ | | < 15 mA | | |
| **Residual current, open state** | 2-wire ⎓ | | < 0.6 mA | | |
| | 2-wire ∿/⎓ | | 1.5 mA | | |
| **Switching capacity** | 4-wire ⎓ | | < 200 mA with overload and short-circuit protection | | |
| | 2-wire ⎓ | | < 100 mA with overload and short-circuit protection | | |
| | 2-wire ∿/⎓ | | ∿: 5…300 mA *(1)*<br>⎓: 5…200 mA *(1)* | | |
| **Voltage drop, closed state** | 4-wire ⎓ | | < 2 V | | |
| | 2-wire ⎓ | | < 4.2 V | | |
| | 2-wire ⎓/∿ | | < 5.5 V | | |
| **Maximum switching frequency** | | | Flush mountable: ⎓ 300 Hz, ∿ 25 Hz<br>Non flush mountable: ⎓ 150 Hz, ∿ 25 Hz | | |
| **Delays** | First-up | | 7 ms (3-wire and 4-wire ⎓), 20 ms (2-wire ⎓ and 2-wire ⎓/∿) | | |
| | Response | | Flush mountable: ≤ 1.2 ms. Non flush mountable: ≤ 1.4 ms | | |
| | Recovery | | Flush mountable: ≤ 1.8 ms. Non flush mountable: ≤ 3.5 ms | | |

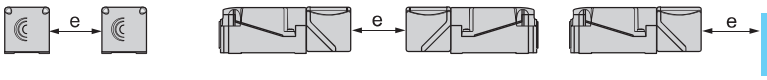
*(1) Sensor must be protected by a 0.4 A quick-blow fuse (reference **XUZE04**) connected in series with the load.*
*(2) SIL 2 protection can only be obtained by connecting both outputs to a safety PLC.*
*(3) These sensors are supplied without a cable gland. An adaptable PG 13.5 cable gland is available (reference **XSZPE13**). Accessories are available for connection to an M12 or 7/8"-16UN connector which can be added to the PG 13.5 sensor. Please consult our Customer Care Centre.*
*(4) Sensors are available for very low temperatures (suffix **TF**: - 40°C, + 70°C) or very high temperatures (suffix **TT**: - 25°C, + 85°C). Please consult our Customer*

# Inductive proximity sensors

XS range, general purpose
Plastic case, 40 x 40 x 117 mm, plug-in
5 position turret head

## Setting-up precautions

### Minimum mounting distances (mm)

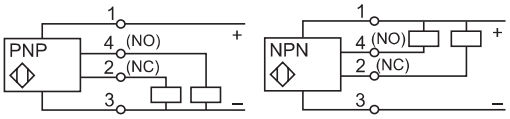



| | | Side by side | Face to face | Facing a metal object |
|---|---|---|---|---|
| Sensors flush mountable in metal | XS7C4A1●● | e ⩾ 60 | e ⩾ 120 | e ⩾ 45 |
| | XS8C4A1●● | e ⩾ 80 | e ⩾ 160 | e ⩾ 60 |
| Sensors non flush mountable in metal | XS8C4A4●● | e ⩾ 160 | e ⩾ 320 | e ⩾ 120 |

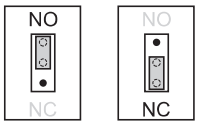
## Wiring schemes

**NO + NC outputs**

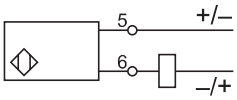
**4-wire ⎓**



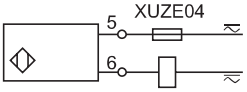

**NO or NC outputs, depending on position of link**



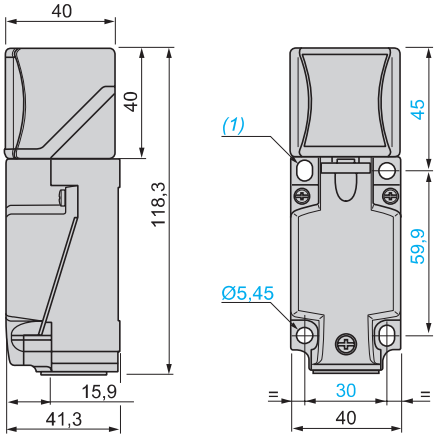

**2-wire ⎓ (non polarised)**




**2-wire ∿ or ⎓ (programmable)**

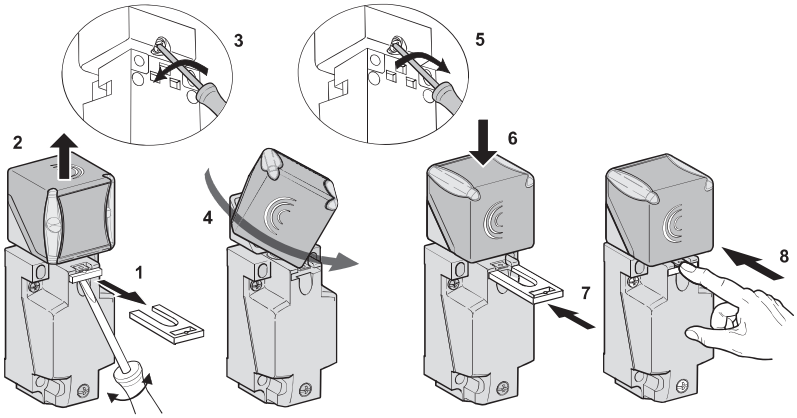



## Dimensions

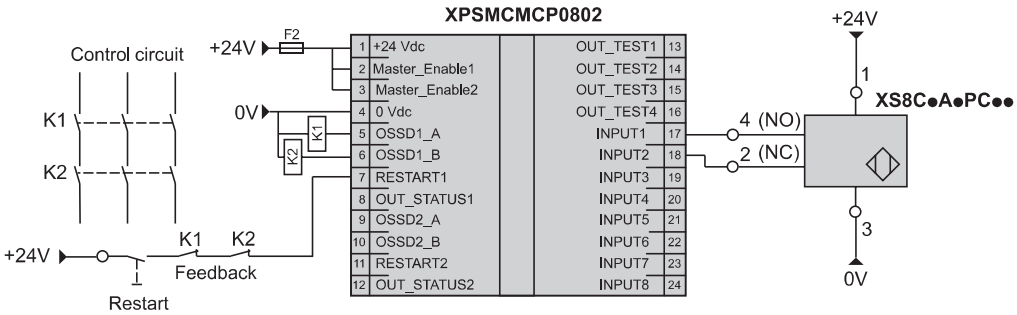



*(1) 2 elongated holes Ø 5.3 x 7 cm.*
*Tightening torque of cover fixing screws and clamp screws: < 1.2 N.m / < 10.62 lb-in*

## Head positions




## Example SIL 2 wiring scheme (with XPSMCMCP0802 safety PLC)




**SFF** (Safe Failure Fraction): 92,68 %
**DC** (Diagnosis Coverage): 75,8 %

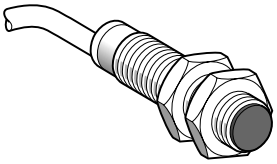
# Inductive proximity sensors

## XS range, general purpose

Multivoltage sensor, cylindrical, flush mountable and non flush mountable

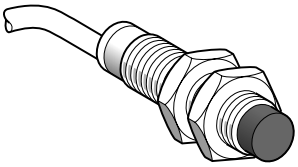
Two-wire AC or DC, short-circuit protection

822102



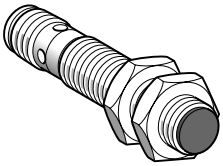
*XS1M●●●●250*

DF532016



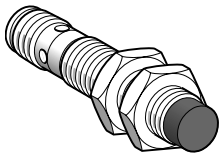
*XS2M●●●●250*

825982



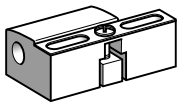
*XS1M●●●●250K*

801225



*XS2M●●●●250K*

825994



*XSZB1●●*

| 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)* | **XS1M12MA250** | 0.075 |
| | | 1/2"-20UNF connector | **XS1M12MA250K** | 0.025 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS1M12MB250** | 0.075 |
| | | 1/2"-20UNF connector | **XS1M12MB250K** | 0.025 |
| **Non flush mountable** | | | | |
| **4** | NO | Pre-cabled (L = 2 m) *(1)* | **XS2M12MA250** | 0.075 |
| | | 1/2"-20UNF connector | **XS2M12MA250K** | 0.025 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS2M12MB250** | 0.075 |
| **Ø 18, threaded M18 x 1** | | | | |
| **Flush mountable** | | | | |
| **5** | NO | Pre-cabled (L = 2 m) *(1)* | **XS1M18MA250** | 0.120 |
| | | 1/2"-20UNF connector | **XS1M18MA250K** | 0.060 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS1M18MB250** | 0.120 |
| | | 1/2"-20UNF connector | **XS1M18MB250K** | 0.060 |
| **Non flush mountable** | | | | |
| **8** | NO | Pre-cabled (L = 2 m) *(1)* | **XS2M18MA250** | 0.120 |
| | | 1/2"-20UNF connector | **XS2M18MA250K** | 0.060 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS2M18MB250** | 0.120 |
| | | 1/2"-20UNF connector | **XS2M18MB250K** | 0.060 |
| **Ø 30, threaded M30 x 1.5** | | | | |
| **Flush mountable** | | | | |
| **10** | NO | Pre-cabled (L = 2 m) *(1)* | **XS1M30MA250** | 0.205 |
| | | 1/2"-20UNF connector | **XS1M30MA250K** | 0.145 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS1M30MB250** | 0.205 |
| | | 1/2"-20UNF connector | **XS1M30MB250K** | 0.145 |
| **Non flush mountable** | | | | |
| **15** | NO | Pre-cabled (L = 2 m) *(1)* | **XS2M30MA250** | 0.205 |
| | | 1/2"-20UNF connector | **XS2M30MA250K** | 0.145 |
| | NC | Pre-cabled (L = 2 m) *(1)* | **XS2M30MB250** | 0.205 |
| | | 1/2"-20UNF connector | **XS2M30MB250K** | 0.145 |

## Accessories *(2)*

| Description mm | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

*(1) For a 5 m long cable add **L1** to the reference; for a 10 m long cable add **L2** to the reference.*
*Example: **XS1M18MA250** becomes **XS1M18MA250L1** with a 5 m long cable.*
*(2) For further information, see page 118.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

## XS range, general purpose

Multivoltage sensor, cylindrical, flush mountable and non flush mountable

Two-wire AC or DC, 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 effective 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 | | Yellow LED, 4 viewing ports at 90° | Yellow LED |
| | Supply on | | – | 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**

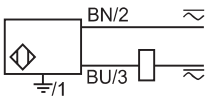
+/- : 2
⏚ : 1
+/- : 3

**Pre-cabled**

BU: Blue
BN: Brown

**2-wire ∿ or ⎓**

**NO or NC output**

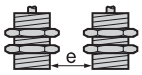


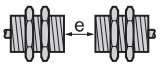

*⏚ : on connector models only.*

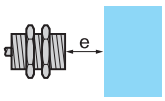
## Setting-up

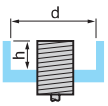
**Minimum mounting distances (mm)**

| 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 |

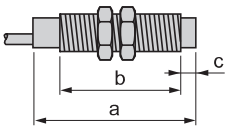



## Dimensions




| Sensor | Flush mountable in metal | | | | | Non flush mountable in metal | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pre-cabled | | Connector | | | Pre-cabled | | Connector | | |
| | a | b | a | b | c | a | b | a | b | c |
| Ø 12 | 57 | 42 | 66 | 48 | 5 | 57 | 42 | 66 | 42 | 5 |
| Ø 18 | 60 | 51 | 72 | 51 | 8 | 60 | 44 | 72 | 44 | 8 |
| Ø 30 | 60 | 51 | 72 | 51 | 13 | 63 | 41 | 75 | 41 | 13 |

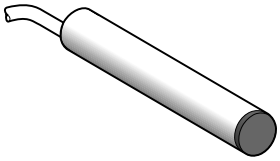
# Inductive proximity sensors

## XS range, general purpose

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

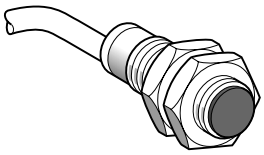
Four-wire DC, solid-state NO + NC output

801120



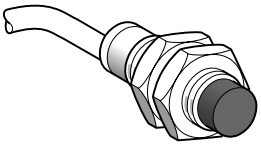
*XS1L06●C410*

801231



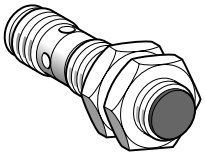
*XS1●●●●C410*

801233



*XS2●●●●C410*

801232



*XS1N●●●C410D*

| 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) | **XS1L06PC410** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1L06NC410** | 0.025 |
| **Ø 8, threaded M8 x 1** | | | | | |
| **Stainless steel case, flush mountable** | | | | | |
| **1.5** | NO + NC | PNP | Pre-cabled (L = 2 m) | **XS1M08PC410** | 0.035 |
| | | | M12 connector | **XS1M08PC410D** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1M08NC410** | 0.035 |
| | | | M12 connector | **XS1M08NC410D** | 0.025 |
| **Stainless steel case, non flush mountable** | | | | | |
| **2.5** | NO + NC | NPN | Pre-cabled (L = 2 m) | **XS2M08NC410** | 0.035 |
| | | | M12 connector | **XS2M08NC410D** | 0.025 |
| **Plastic case, non flush mountable** | | | | | |
| **2.5** | NO + NC | PNP *(3)* | Pre-cabled (L = 2 m) *(1)* | **XS4P08PC410** | 0.035 |
| **Ø 12, threaded M12 x 1** | | | | | |
| **Brass case, flush mountable** | | | | | |
| **2** | NO + NC | PNP | Pre-cabled (L = 2 m) *(1) (2)* | **XS1N12PC410** | 0.070 |
| | | | M12 connector | **XS1N12PC410D** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS1N12NC410** | 0.070 |
| | | | M12 connector | **XS1N12NC410D** | 0.020 |
| **Plastic case, non flush mountable** | | | | | |
| **4** | NO + NC | PNP *(3)* | Pre-cabled (L = 2 m) *(1)* | **XS4P12PC410** | 0.070 |
| | | | M12 connector | **XS4P12PC410D** | 0.020 |

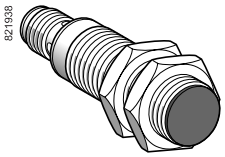
*(1) For a 5 m long cable add **L1** to the reference. Example: **XS1N12PC410** becomes **XS1N12PC410L1** with a 5 m long cable.*
*(2) For a 10 m long cable add **L2** to the reference. Example: **XS1N12PC410** becomes **XS1N12PC410L2** with a 10 m long cable.*
*(3) These sensors can be supplied in NPN versions. Please contact our Customer Care Centre.*

# Inductive proximity sensors

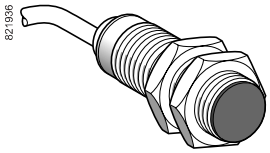
## XS range, general purpose

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

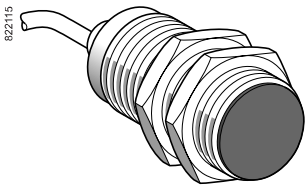
Four-wire DC, solid-state NO + NC output



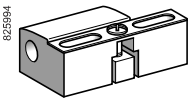
*XS●●18●C410*



*XS●●18●C410D*



*XS●●30●C410*



*XSZB1●●*

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Ø 18, threaded M18 x 1** | | | | | |
| **Brass case, flush mountable** | | | | | |
| **5** | NO + NC | PNP | Pre-cabled (L = 2 m) *(1) (2)* | **XS1N18PC410** | 0.100 |
| | | | M12 connector | **XS1N18PC410D** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1N18NC410** | 0.100 |
| | | | M12 connector | **XS1N18NC410D** | 0.040 |
| **Plastic case, non flush mountable** | | | | | |
| **8** | NO + NC | PNP *(3)* | Pre-cabled (L = 2 m) | **XS4P18PC410** | 0.100 |
| | | | M12 connector | **XS4P18PC410D** | 0.040 |
| **Ø 30, threaded M30 x 1.5** | | | | | |
| **Brass case, flush mountable** | | | | | |
| **10** | NO + NC | PNP | Pre-cabled (L = 2 m) *(1) (2)* | **XS1N30PC410** | 0.160 |
| | | | M12 connector | **XS1N30PC410D** | 0.100 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1N30NC410** | 0.160 |
| | | | M12 connector | **XS1N30NC410D** | 0.100 |
| **Plastic case, non flush mountable** | | | | | |
| **15** | NO + NC | PNP *(3)* | Pre-cabled (L = 2 m) | **XS4P30PC410** | 0.160 |
| | | | M12 connector | **XS4P30PC410D** | 0.100 |

### Accessories *(4)*

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 8 | **XSZB108** | 0.006 |
| | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

*(1) For a 5 m long cable add **L1** to the reference. Example: **XS1N18PC410** becomes **XS1N18PC410L1** with a 5 m long cable.*
*(2) For a 10 m long cable add **L2** to the reference. Example: **XS1N18PC410** becomes **XS1N18PC410L2** with a 10 m long cable.*
*(3) These sensors can be supplied in NPN versions. Please contact our Customer Care Centre.*
*(4) For further information, see page 118.*

# Inductive proximity sensors

## XS range, general purpose

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

Four-wire DC, solid-state NO + NC output

## Characteristics

| Sensor type | | | XS●●●●PC410D | XS●●●●NC410D | XS●●●●PC410 | XS●●●●NC410 |
|---|---|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE, E2 *(1)* | UL, CSA, CE | UL, CSA, CE, E2 *(2)* | UL, CSA, CE |
| **Conformity to safety standards** | Ø 6.5 and Ø 8 | | – | | | |
| | Ø 12, Ø 18 and Ø 30 | | EN/IEC 61508: SIL 2<br>EN/ISO 13849-1:<br>PL =d<br>IEC 62061: SILcl2 *(3)* | – | EN/IEC 61508: SIL 2<br>EN/ISO 13849-1:<br>PL =d<br>IEC 62061: SILcl2 *(4)* | – |
| **Reliability data** | Ø 12, Ø 18 and Ø 30 | | MTTFd = 1829 years,<br>PFHd = 62 $10^{-9}$ 1/h,<br>SFF > 92 %,<br>DC > 74 % (with a safety controller) *(3)* | – | MTTFd = 1829 years,<br>PFHd = 62 $10^{-9}$ 1/h,<br>SFF > 92 %,<br>DC > 74 % (with a safety controller) *(4)* | – |
| **Connection** | | | M12 connector | | Pre-cabled, length: 2 m | |
| **Operating zone** | Ø 6.5 and Ø 8 flush mountable | **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 effective sensing distance (Sr) | | | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 65 and IP 67 | IP 67 | IP 67, double insulation (Ø 6.5 and Ø 8)<br>IP 68, double insulation (Ø 12, Ø 18 and Ø 30) | |
| | Conforming to DIN 40050 | | IP 69K (Ø 12, Ø 18 and Ø 30) | – | – | |
| **Storage temperature** | | **°C** | - 40…+ 85 | | | |
| **Operating temperature** | | **°C** | - 25…+ 70 *(5)* | | | |
| **Materials** | Case | | Nickel plated brass for XS1N●●●.<br>Stainless steel 303 for XS1M08●●● and XS2M08●●●.<br>Plastic, PPS, for XS4P●●●. | | | |
| | Cable | | – | | PvR 4 x 0.08 mm² (Ø 6.5 and Ø 8)<br>PvR 4 x 0.22 mm² (Ø 12, Ø 18 and Ø 30) | |
| **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** | ⎓ 9…36<br>(⎓ 10…36 for XS4P●●●) | ⎓ 10…36 | ⎓ 9…36<br>(⎓ 10…36 for XS4P18●●●) | ⎓ 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 | | | |

*(1) Except **XS4P●●●**: UL, CSA and CE.*
*(2) Except **XS4P18●●●**: UL, CSA and CE.*
*(3) Except **XS4P●●●**.*
*(4) Except **XS4P18●●●**.*
*(5) Sensors are available for very low temperatures (suffix **TF**: -40°C, + 70°C) or very high temperatures (suffix **TT**: - 25°C, + 85°C). Please consult our Customer Care Centre.*

*Schemes, setting-up, dimensions*

# Inductive proximity sensors

XS range, general purpose
Cylindrical, metal and plastic, flush mountable and non flush mountable
Four-wire DC, solid-state NO + NC output

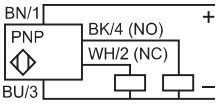
## Wiring schemes

### M12 connector

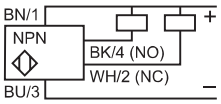
### Pre-cabled

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

### PNP 4-wire




### NPN 4-wire

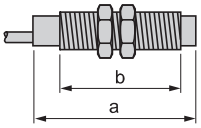



## Setting-up

### 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 | **XS1L06** | e ≥ 3 | e ≥ 18 | e ≥ 4.5 | d ≥ 6.5 h ≥ 0 |
| **Ø 8** flush mountable | **XS1M08** | e ≥ 3 | e ≥ 18 | e ≥ 4.5 | d ≥ 8 h ≥ 0 |
| **Ø 8** non flush mountable | **XS4P08** | e ≥ 10 | e ≥ 30 | e ≥ 7.5 | d ≥ 24 h ≥ 5 |
| **Ø 12** flush mountable | **XS1N12** | e ≥ 4 | e ≥ 24 | e ≥ 6 | d ≥ 12 h ≥ 0 |
| **Ø 12** non flush mountable | **XS4P12** | e ≥ 16 | e ≥ 48 | e ≥ 12 | d ≥ 36 h ≥ 8 |
| **Ø 18** flush mountable | **XS1N18** | e ≥ 10 | e ≥ 60 | e ≥ 15 | d ≥ 18 h ≥ 0 |
| **Ø 18** non flush mountable | **XS4P18** | e ≥ 16 | e ≥ 96 | e ≥ 24 | d ≥ 54 h ≥ 16 |
| **Ø 30** flush mountable | **XS1N30** | e ≥ 20 | e ≥ 120 | e ≥ 30 | d ≥ 30 h ≥ 0 |
| **Ø 30** non flush mountable | **XS4P30** | e ≥ 60 | e ≥ 180 | e ≥ 45 | d ≥ 90 h ≥ 30 |

## Dimensions




### Flush mountable in metal

| Sensor | | Pre-cabled (mm) a | Pre-cabled (mm) b | M12 connector (mm) a | M12 connector (mm) b |
|---|---|---|---|---|---|
| **Ø 6.5** stainless steel | **XS1L06** | 50 | – | – | – |
| **Ø 8** stainless steel | **XS1M08** | 51 | 42 | 62 | 40 |
| **Ø 12** brass | **XS1N12** | 37 | 25 | 50 | 31 |
| **Ø 18** brass | **XS1N18** | 41 | 29 | 51 | 28 |
| **Ø 30** brass | **XS1N30** | 45 | 33 | 54 | 33 |

### Non flush mountable in metal

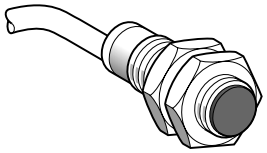
| Sensor | | Pre-cabled (mm) a | Pre-cabled (mm) b | M12 connector (mm) a | M12 connector (mm) b |
|---|---|---|---|---|---|
| **Ø 8** stainless steel | **XS2M08** | 54 | 42 | 65 | 40 |
| **Ø 8** plastic | **XS4P08** | 34 | 25 | – | – |
| **Ø 12** plastic | **XS4P12** | 37 | 25 | 50 | 31 |
| **Ø 18** plastic | **XS4P18** | 41 | 29 | 51 | 28 |
| **Ø 30** plastic | **XS4P30** | 45 | 33 | 54 | 33 |

# Inductive proximity sensors

## XS range, general purpose

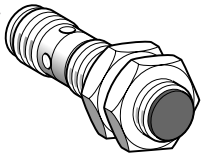
Cylindrical, metal, increased range, flush mountable
Four-wire DC, solid-state NO + NC output

801231



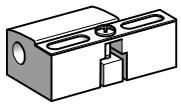
*XS1●●B3PCL2*

801232



*XS112B3PCM12*

825994



*XSZB●●●*

### Sensors, 4-wire

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Ø 8, threaded M8 x 1** | | | | | |
| **2.5** | NO + NC | PNP | Pre-cabled (L = 2 m) | **XS608B1PCL2** | 0.035 |
| | | | M12 connector | **XS608B1PCM12** | 0.025 |
| **Ø 12, threaded M12 x 1** | | | | | |
| **4** | NO + NC | PNP | Pre-cabled (L = 2 m) | **XS112B3PCL2** | 0.070 |
| | | | M12 connector | **XS112B3PCM12** | 0.020 |
| **Ø 18, threaded M18 x 1** | | | | | |
| **8** | NO + NC | PNP | Pre-cabled (L = 2 m) | **XS118B3PCL2** | 0.100 |
| | | | M12 connector | **XS118B3PCM12** | 0.040 |
| **Ø 30, threaded M30 x 1.5** | | | | | |
| **15** | NO + NC | PNP | Pre-cabled (L = 2 m) | **XS130B3PCL2** | 0.160 |
| | | | M12 connector | **XS130B3PCM12** | 0.100 |

### Accessories *(1)*

| Description | For use with sensors | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 8 | **XSZB108** | 0.006 |
| | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

*(1) For further information, see page 118.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

## XS range, general purpose

Cylindrical, metal, increased range, flush mountable
Four-wire DC, solid-state NO + NC output

## Characteristics

| Sensor type | | | XS1●●B3PCM12 / XS608B1PCM12 | XS1●●B3PCL2 / XS608B1PCL2 |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE, E2 | |
| **Conformity to safety standards only for Ø 12 to Ø 30** | | | EN/IEC 61508: SIL 2<br>EN/ISO 13849-1: PL =d<br>IEC 62061: SILcl2 | |
| **Reliability data only for Ø 12 to Ø 30** | | | MTTFd = 1829 years, PFHd = 62 $10^{-9}$ 1/h,<br>SFF > 92 %, DC > 74 % (with a safety controller) | |
| **Connection** | Connector | | M12 | – |
| | Pre-cabled | | – | Length 2 m |
| **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 effective sensing distance (Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 65 and IP 67 | IP 65 and IP 68, double insulation ⧈ |
| | Conforming to DIN 40050 | | IP 69K | – |
| **Storage temperature** | | **°C** | - 40…+ 85 | |
| **Operating temperature** | | **°C** | - 25…+ 70 *(2)* | |
| **Materials** | Case | | Nickel plated brass for Ø 12 to Ø 30, stainless steel grade 303 for Ø 8 | |
| | Sensing face | | PPS | |
| | Cable | | – | PvR 4 x 0.22 mm² except 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 (**XS1**), ⎓12…48 (**XS6**),with protection against reverse polarity | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 9…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 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 | |

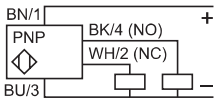
## Wiring schemes

### M12 connector

### Pre-cabled

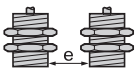
BU: Blue
BN: Brown
BK: Black
WH: White

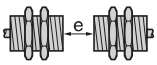
### PNP 4-wire

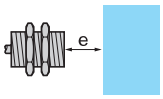



## Setting-up

### Minimum mounting distances (mm)

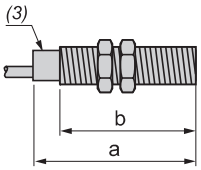



| Sensors | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 8 | e ⩾ 5 | e ⩾ 30 | e ⩾ 8 |
| Ø 12 | e ⩾ 8 | e ⩾ 50 | e ⩾ 12 |
| Ø 18 | e ⩾ 16 | e ⩾ 100 | e ⩾ 25 |
| Ø 30 | e ⩾ 30 | e ⩾ 180 | e ⩾ 45 |

## Dimensions



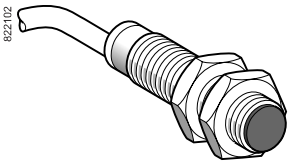

| | **Pre-cabled** (mm) | | **M12 connector** (mm) | |
|---|---|---|---|---|
| **Sensors** | **a** | **b** | **a** | **b** |
| Ø 8 | 51 | 42 | 61 | 40 |
| Ø 12 | 37 | 25 | 50 | 31 |
| Ø 18 | 41 | 29 | 51 | 28 |
| Ø 30 | 45 | 33 | 54 | 33 |

*(1) Detection curves, see page 122.*
*(2) Sensors are available for very low temperatures (suffix **TF**: -40°C, + 70°C) or very high temperatures (suffix **TT**: - 25°C, + 85°C). Please consult our Customer Care Centre.*
*(3) LED.*

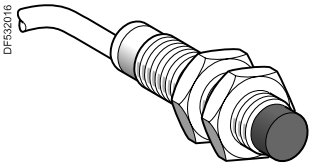
# Inductive proximity sensors

## XS range, general purpose

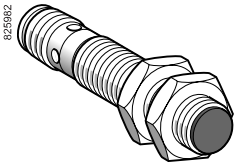
Cylindrical, metal and plastic, flush and non flush mountable
Four-wire DC, solid-state PNP + NPN NO/NC programmable output



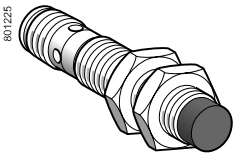

*XS1M●●KP340*
*XS4P●●KP340*



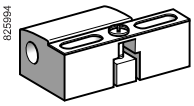

*XS2M●●KP340*




*XS1M●●KP340D*
*XS4P●●KP340D*




*XS2M●●KP340D*




*XSZB1●●*

| 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)* | **XS1M12KP340** | 0.075 |
| | | | M12 connector | **XS1M12KP340D** | 0.025 |
| **Metal case, non flush mountable** | | | | | |
| **4** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS2M12KP340** | 0.075 |
| | | | M12 connector | **XS2M12KP340D** | 0.025 |
| **Plastic case, non flush mountable** | | | | | |
| **4** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS4P12KP340** | 0.075 |
| | | | M12 connector | **XS4P12KP340D** | 0.025 |
| **Ø 18, threaded M18 x 1** | | | | | |
| **Metal case, flush mountable** | | | | | |
| **5** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS1M18KP340** | 0.120 |
| | | | M12 connector | **XS1M18KP340D** | 0.060 |
| **Metal case, non flush mountable** | | | | | |
| **8** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS2M18KP340** | 0.120 |
| | | | M12 connector | **XS2M18KP340D** | 0.060 |
| **Plastic case, non flush mountable** | | | | | |
| **8** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS4P18KP340** | 0.120 |
| | | | M12 connector | **XS4P18KP340D** | 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)* | **XS1M30KP340** | 0.205 |
| | | | M12 connector | **XS1M30KP340D** | 0.145 |
| **Metal case, non flush mountable** | | | | | |
| **15** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS2M30KP340** | 0.205 |
| | | | M12 connector | **XS2M30KP340D** | 0.145 |
| **Plastic case, non flush mountable** | | | | | |
| **15** | NO/NC programmable | PNP + NPN | Pre-cabled (L = 2 m) *(1)* | **XS4P30KP340** | 0.205 |
| | | | M12 connector | **XS4P30KP340D** | 0.145 |

## Accessories *(2)*

| Description mm | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

*(1) For a 5 m long cable add **L1** to the reference; for a 10 m long cable add **L2** to the reference.*
*Example: **XS1M12KP340** becomes **XS1M12KP340L1** with a 5 m long cable.*
*(2) For further information, see page 118.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

## XS range, general purpose

Cylindrical, metal and plastic, flush and non flush mountable
Four-wire DC, 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 effective 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 XS1M and XS2M, PPS for XS4P | |
| | 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**

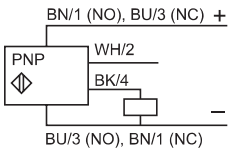
**Pre-cabled**

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

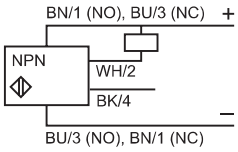
**PNP + NPN**

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

**PNP**



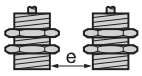

**NPN**

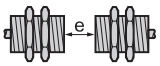


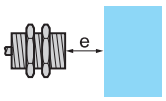

## Setting-up

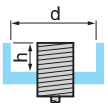
**Minimum mounting distances (mm)**

| Sensor | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| Ø 12 flush mountable **XS1M12** | e ≥ 4 | e ≥ 24 | e ≥ 6 | d ≥ 12 h ≥ 0 |
| Ø 12 non flush mountable **XS2M12** and **XS4P12** | e ≥ 16 | e ≥ 48 | e ≥ 12 | d ≥ 36 h ≥ 8 |
| Ø 18 flush mountable **XS1M18** | e ≥ 10 | e ≥ 60 | e ≥ 15 | d ≥ 18 h ≥ 0 |
| Ø 18 non flush mountable **XS2M18** and **XS4P18** | e ≥ 16 | e ≥ 96 | e ≥ 24 | d ≥ 54 h ≥ 16 |
| Ø 30 flush mountable **XS1M30** | e ≥ 20 | e ≥ 120 | e ≥ 30 | d ≥ 30 h ≥ 0 |
| Ø 30 non flush mountable **XS2M30** and **XS4P30** | e ≥ 60 | e ≥ 180 | e ≥ 45 | d ≥ 90 h ≥ 30 |

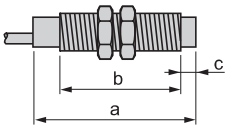



## Dimensions




| 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 | 54 | 42 | 61 | 42 | 55 | 42 | 66 | 42 | 5 |
| Ø 12 plastic | – | – | – | – | 54 | 42 | 61 | 43 | 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 | 63 | 41 | 75 | 41 | 13 |
| Ø 30 plastic | – | – | – | – | 60 | 51 | 70 | 51 | 0 |

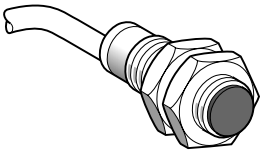
# Inductive proximity sensors

## XS range, general purpose

Plastic, cylindrical, non flush mountable
Two-wire AC or DC
Three-wire DC, solid-state output

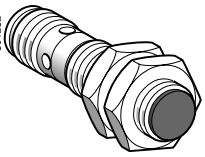
ECOLAB certified

801231



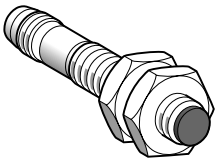
*XS4P●●●●340*
*XS4P●●●●370*
*XS4P●●●●230*

801232



*XS4P●●●●340D*
*XS4P●●●●370D*
*XS4P●●●●230K*

801167



*XS4P08●●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)* | **XS4P08PA340** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (2)* | **XS4P08NA340** | 0.025 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1) (2)* | **XS4P08PB340** | 0.025 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (2)* | **XS4P08NB340** | 0.025 |
| **Three-wire ⎓ 12-48 V** | | | | | |
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS4P08PA370** | 0.030 |
| **Two-wire ∿ or ⎓ 24-240 V** | | | | | |
| **2.5** | NO | | Pre-cabled (L = 2 m) *(1)* | **XS4P08MA230** | 0.030 |
| | | | 1/2"-20UNF connector | **XS4P08MA230K** | 0.020 |
| | NC | | Pre-cabled (L = 2 m) *(1)* | **XS4P08MB230** | 0.030 |
| | | | 1/2"-20UNF connector | **XS4P08MB230K** | 0.020 |
| **Ø 12, threaded M12 x 1** | | | | | |
| **Three-wire ⎓ 12-24 V** | | | | | |
| **4** | NO | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P12PA340** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P12NA340** | 0.060 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P12PB340** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P12NB340** | 0.060 |
| **Three-wire ⎓ 12-48 V** | | | | | |
| **4** | NO | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P12PA370** | 0.065 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P12NA370** | 0.065 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P12PB370** | 0.065 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS4P12NB370** | 0.065 |
| **Two-wire ∿ or ⎓ 24-240 V** | | | | | |
| **4** | NO | | Pre-cabled (L = 2 m) *(1)* | **XS4P12MA230** | 0.065 |
| | | | 1/2"-20UNF connector | **XS4P12MA230K** | 0.030 |
| | NC | | Pre-cabled (L = 2 m) *(1)* | **XS4P12MB230** | 0.065 |
| | | | 1/2"-20UNF connector | **XS4P12MB230K** | 0.030 |
| **Ø 18, threaded M18 x 1** | | | | | |
| **Three-wire ⎓ 12-24 V** | | | | | |
| **8** | NO | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P18PA340** | 0.090 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P18NA340** | 0.090 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P18PB340** | 0.090 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P18NB340** | 0.090 |
| **Three-wire ⎓ 12-48 V** | | | | | |
| **8** | NO | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P18PA370** | 0.100 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P18NA370** | 0.100 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P18PB370** | 0.100 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS4P18NB370** | 0.100 |
| **Two-wire ∿ or ⎓ 24-240 V** | | | | | |
| **8** | NO | | Pre-cabled (L = 2 m) *(1)* | **XS4P18MA230** | 0.100 |
| | | | 1/2"-20UNF connector | **XS4P18MA230K** | 0.040 |
| | NC | | Pre-cabled (L = 2 m) *(1)* | **XS4P18MB230** | 0.100 |
| | | | 1/2"-20UNF connector | **XS4P18MB230K** | 0.040 |
| **Ø 30, threaded M30 x 1.5** | | | | | |
| **Three-wire ⎓ 12-24 V** | | | | | |
| **15** | NO | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P30PA340** | 0.120 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P30NA340** | 0.120 |
| | NC | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P30PB340** | 0.120 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P30NB340** | 0.120 |
| **Three-wire ⎓ 12-48 V** | | | | | |
| **15** | NO | PNP | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P30PA370** | 0.140 |
| | | NPN | Pre-cabled (L = 2 m) *(1) (3)* | **XS4P30NA370** | 0.140 |
| | NC | PNP | Pre-cabled (L = 2 m) *(3)* | **XS4P30PB370** | 0.140 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS4P30NB370** | 0.140 |
| **Two-wire ∿ or ⎓** | | | | | |
| **15** | NO | | Pre-cabled (L = 2 m) *(1)* | **XS4P30MA230** | 0.140 |
| | | | 1/2"-20UNF connector | **XS4P30MA230K** | 0.080 |
| | NC | | Pre-cabled (L = 2 m) *(1)* | **XS4P30MB230** | 0.140 |
| | | | 1/2"-20UNF connector | **XS4P30MB230K** | 0.080 |

*(1) For a 5 m long cable add **L1** to the reference; for a 10 m long cable add **L2** to the reference. Example: **XS4P08PA340** becomes **XS4P08PA340L1** with a 5 m long cable.*
*(2) For an M8 connector, add **S** to the reference. Example: **XS4P08PA340** becomes **XS4P08PA340S** with an M8 connector.*
*(3) For an M12 connector, add **D** to the reference. Example: **XS4P12PA370** becomes **XS4P12PA370D** with an M12 connector.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

## XS range, general purpose

Plastic, cylindrical, non flush mountable
Two-wire AC or DC
Three-wire DC, solid-state output

## Characteristics

| Sensor type | | | XS4P●●●●340● | XS4P●●●●370● | XS4P●●M●230● |
|---|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE, ECOLAB | | |
| **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 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 effective 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 8: 3 x 0.11 mm² | | PvR 2 x 0.34 mm²<br>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 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

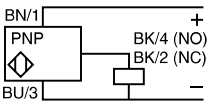
1/2"-20UNF

⎓: 2
⎓: 3

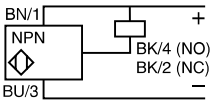
### Pre-cabled

BU: Blue
BN: Brown
BK: Black

### PNP

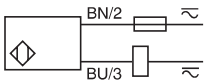



### NPN




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

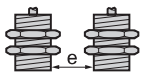
### 2-wire ∼ or ⎓

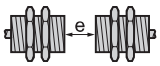


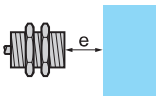

## Setting-up

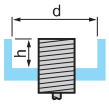
### Minimum mounting distances (mm)

| | 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 |

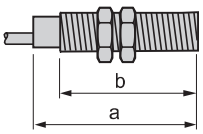



## Dimensions



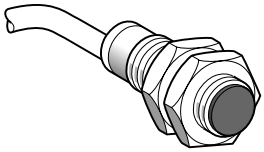

| XS4P | 3-wire ⎓ 12-24 V Pre-cabled (mm) a | b | Connector (mm) a | b | 3-wire ⎓ 12-48 V or 2-wire ∼/⎓ 24-240 V Pre-cabled (mm) a | b | Connector (mm) a | b |
|---|---|---|---|---|---|---|---|---|
| Ø 8 | 33 | 26 | 42 | 26 | 50 | 42 | 61 | 40 |
| Ø 12 | 35 | 25 | 48 | 27 | 54 | 42 | 61 | 42 |
| Ø 18 | 36 | 25 | 48 | 29 | 62 | 52 | 70 | 52 |
| Ø 30 | 43 | 32 | 50 | 34 | 62 | 52 | 70 | 52 |

# Inductive proximity sensors

## XS range, general purpose

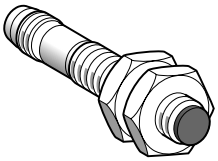
Cylindrical, almost flush mountable, increased range
Three-wire DC, solid-state output

801231



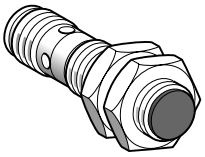
*XS1N●●●●349*

801167

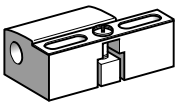


*XS1N08●●349S*

801232



*XS1N●●●●349D*



*XSZB1●●*

## References

| Sensing distance (Sn) (mm) | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Ø 8, threaded M8 x 1** | | | | | |
| **2.5** | NO | PNP | Pre-cabled (L = 2 m) | **XS1N08PA349** | 0.035 |
| | | | M8 connector | **XS1N08PA349S** | 0.015 |
| | | | M12 connector | **XS1N08PA349D** | 0.020 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1N08PB349** | 0.035 |
| | | | M8 connector | **XS1N08PB349S** | 0.015 |
| | | | M12 connector | **XS1N08PB349D** | 0.020 |
| **Ø 12, threaded M12 x 1** | | | | | |
| **4** | NO | PNP | Pre-cabled (L = 2 m) | **XS1N12PA349** | 0.070 |
| | | | M12 connector | **XS1N12PA349D** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1N12NA349** | 0.070 |
| | | | M12 connector | **XS1N12NA349D** | 0.020 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1N12PB349** | 0.070 |
| | | | M12 connector | **XS1N12PB349D** | 0.020 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1N12NB349** | 0.070 |
| | | | M12 connector | **XS1N12NB349D** | 0.020 |
| **Ø 18, threaded M18 x 1** | | | | | |
| **10** | NO | PNP | Pre-cabled (L = 2 m) | **XS1N18PA349** | 0.100 |
| | | | M12 connector | **XS1N18PA349D** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1N18NA349** | 0.100 |
| | | | M12 connector | **XS1N18NA349D** | 0.040 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1N18PB349** | 0.100 |
| | | | M12 connector | **XS1N18PB349D** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1N18NB349** | 0.100 |
| | | | M12 connector | **XS1N18NB349D** | 0.040 |
| **Ø 30, threaded M30 x 1.5** | | | | | |
| **20** | NO | PNP | Pre-cabled (L = 2 m) | **XS1N30PA349** | 0.160 |
| | | | M12 connector | **XS1N30PA349D** | 0.100 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1N30NA349** | 0.160 |
| | | | M12 connector | **XS1N30NA349D** | 0.100 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1N30PB349** | 0.160 |
| | | | M12 connector | **XS1N30PB349D** | 0.100 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1N30NB349** | 0.160 |
| | | | M12 connector | **XS1N30NB349D** | 0.100 |

## Accessories *(1)*

| Description mm | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 8 | **XSZB108** | 0.006 |
| | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

*(1) For further information, see page 118.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

XS range, general purpose

Cylindrical, almost flush mountable, increased range

Three-wire DC, 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 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 effective 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 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 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 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**

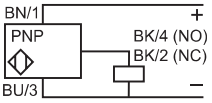
M8

M12

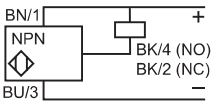
**Pre-cabled**

BU: Blue
BN: Brown
BK: Black

**PNP 3-wire**




**NPN 3-wire**

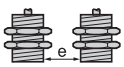


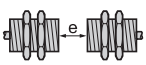

For M8 connector, NO and NC outputs on terminal 4

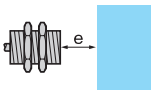
## Setting-up precautions

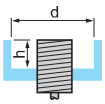
**Minimum mounting distances (mm)**

| Sensor | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| 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 |

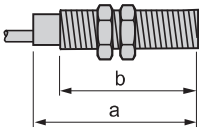



## Dimensions




**Flush mountable in metal**

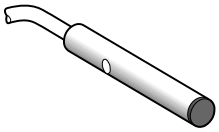
| Sensor | Pre-cabled a | Pre-cabled b | M8 connector a | M8 connector b | M12 connector a | M12 connector b |
|---|---|---|---|---|---|---|
| Ø 8 | 33 | 25 | 42 | 26 | 45 | 23 |
| Ø 12 | 35 | 25 | – | – | 50 | 30 |
| Ø 18 | 39 | 28 | – | – | 50 | 28 |
| Ø 30 | 43 | 32 | – | – | 55 | 32 |

# Inductive proximity sensors

## XS range, general purpose

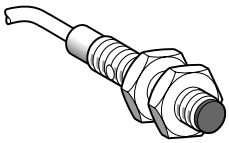
Miniature, cylindrical, flush mountable
Three-wire DC, solid-state output

801308



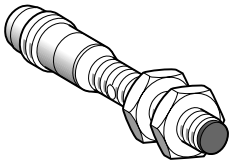
*XS1L04●●310*

801316



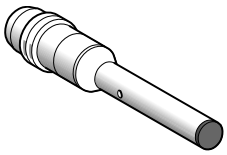
*XS1N05●●310*

801315



*XS1N05●●311S*

801309



*XS1L04●●310S*

### 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) | **XS1L04PA310** | 0,025 |
| | | | M8 connector | **XS1L04PA310S** | 0.010 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1L04NA310** | 0.025 |
| | | | M8 connector | **XS1L04NA310S** | 0.010 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1L04PB310** | 0.025 |
| | | | M8 connector | **XS1L04PB310S** | 0.010 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1L04NB310** | 0.025 |
| | | | M8 connector | **XS1L04NB310S** | 0.010 |
| **Stainless steel case, flush mountable** | | | | | |
| **0,8** | NO | PNP | Pre-cabled (L = 2 m) | **XS1L04PA311** | 0.025 |
| | | | M8 connector | **XS1L04PA311S** | 0.010 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1L04NA311** | 0.025 |
| | | | M8 connector | **XS1L04NA311S** | 0.010 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1L04PB311** | 0.025 |
| | | | M8 connector | **XS1L04PB311S** | 0,010 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1L04NB311** | 0.025 |
| | | | M8 connector | **XS1L04NB311S** | 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) | **XS1N05PA310** | 0,030 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1N05NA310** | 0,030 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1N05PB310** | 0,030 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1N05NB310** | 0,030 |
| **Stainless steel case, flush mountable** | | | | | |
| **0.8** | NO | PNP | Pre-cabled (L = 2 m) | **XS1N05PA311** | 0.030 |
| | | | M8 connector | **XS1N05PA311S** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1N05NA311** | 0.030 |
| | | | M8 connector | **XS1N05NA311S** | 0.015 |
| | NC | PNP | Pre-cabled (L = 2 m) | **XS1N05PB311** | 0.030 |
| | | | M8 connector | **XS1N05PB311S** | 0.015 |
| | | NPN | Pre-cabled (L = 2 m) | **XS1N05NB311** | 0.030 |
| | | | M8 connector | **XS1N05NB311S** | 0.015 |

*(1) For accessories, see page 118.*
*(2) For a 5 m long cable add **L1** to the reference; for a 10 m long cable add **L2** to the reference.*
*Example: **XS1L04PA310** becomes **XS1L04PA310L1** with a 5 m long cable.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

## XS range, general purpose

Miniature, cylindrical, flush mountable
Three-wire DC, solid-state output

## Characteristics

| Sensor type | | | XS1●●●●●●●●S | XS1●●●●●●● |
|---|---|---|---|---|
| **Product certifications** | | | UL, CSA, CE | |
| **Connection** *(1)* | Connector | | M8 on **XS1●●●●●●●●S** | – |
| | Pre-cabled | | – | Length: 2 m |
| **Operating zone** | Ø 4 | **mm** | **0…0.8 (brass), 0…0.6 (stainless steel)** | |
| | Ø 5 | **mm** | **0…0.8 (brass), 0…0.6 (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 303 | |
| | Cable | | PvR 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** | ⎓ 5…24 for **XS1L04●●●●●●** and **XS1N05●●●●●●** | |
| **Voltage limits (including ripple)** | | **V** | ⎓ 5…30 for **XS1L04●●●●●●** and **XS1N05●●●●●●** | |
| **Current consumption, no-load** | | **mA** | ≤ 10 | |
| **Switching capacity** | 3-wire PNP/NPN | **mA** | ≤ 100 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 122*

## Wiring schemes

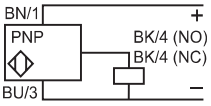
**Connector**

M8

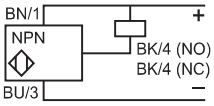
**Pre-cabled**

BU: Blue
BN: Brown
BK: Black

**PNP 3-wire**



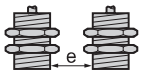

**NPN 3-wire**

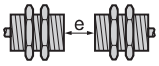


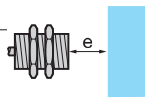

## Setting-up

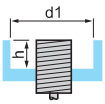
**Minimum mounting distances (mm)**

| 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 |



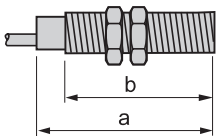




**Tightening torque**

Stainless steel: 2.2 N.m. Brass: 1.6 N.m (values obtained with washers mounted)

## Dimensions



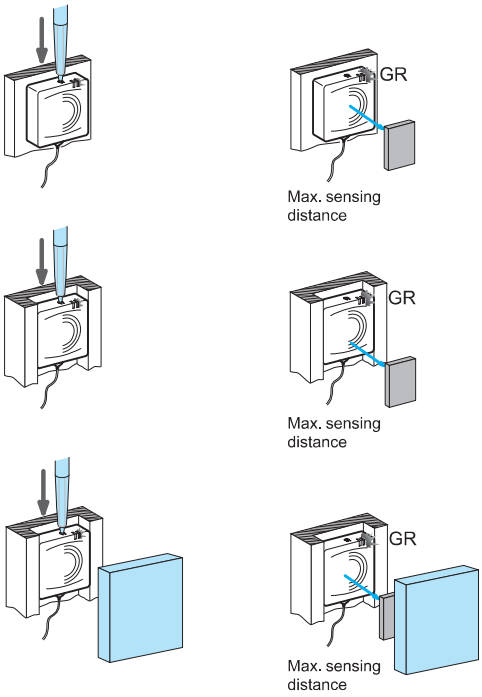

| Sensor | Pre-cabled | | M8 connector | |
|---|---|---|---|---|
| | a | b | a | b |
| Ø 4 | 28 | – | 43 | – |
| Ø 5 | 28 | 24 | 43 | 24 |

# Inductive proximity sensors

XS range

Flush mountability using teach mode: simplicity through innovation

## Operating principle




In proposing flush mountable sensors using teach mode, Telemecanique Sensors offers simplicity through innovation.

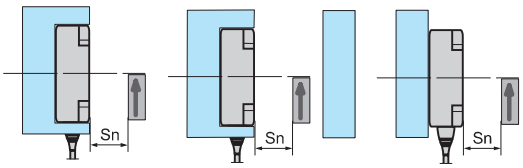
■ A single product enables flush mounting using teach mode and meets all the requirements for inductive detection of metal objects.
By simply pressing the “Teach mode” button, the sensor automatically acquires optimum configuration for all detection, flush mountability and environment requirements.

■ Other advantages of flush mountable sensors using teach mode
□ Increased performance:
- sensing distance guaranteed and optimised irrespective of the mounting method, object, environment or background,
- suitable for all metal environments.

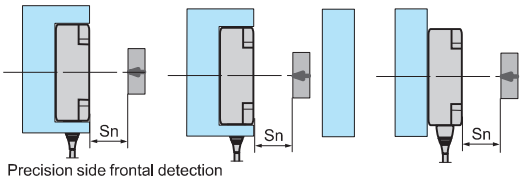
□ Simplified use provided by:
- the flush mountability using teach mode technology, associated with the availability of the flattest and most compact sensors on the market, ensures full integration in the machine and limits the risks of mechanical damage,
- mechanical adjustments no longer necessary due to teach mode.

□ Lower costs due to:
- the elimination of adjustment times and complex supports
- 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




Precision side approach detection



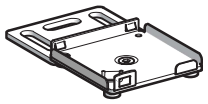

Precision side frontal detection

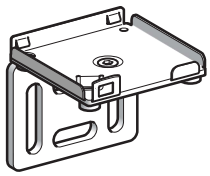
All flush mountable inductive proximity sensors using teach mode benefit from ultra precise adjustment, which is very quick irrespective of the metal environment.

■ Precision side approach detection makes it possible to accurately define the distance at which the object will be detected as it passes the sensor.
On the flush mountable sensors using teach mode, 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 distance at which the object will be detected as it approaches the sensor.
On the flush mountable sensors using teach mode, the desired detection position can be stored in memory by simply pressing the teach button.

## Mounting accessories





Telemecanique Sensors offers a complete, inexpensive range of mounting accessories (clamps, plates, brackets, etc.) that provide solutions for all installation problems.

■ Fixing kits for quick installation or replacement of sensors

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

# Inductive proximity sensors

XS range

Flush mountability using teach mode: simplicity through innovation

*XS612B2* *XS618B2* *XS630B2*

## 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** | | **XS612B2** | **XS618B2** | **XS630B2** |
| **Page** | | 72 | | |

*XS8E1A1* *XS8C1A1* *XS8D1A1*

## 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** | | **XS8E1A1** | **XS8C1A1** | **XS8D1A1** |
| **Page** | | 74 | | |

# Inductive proximity sensors

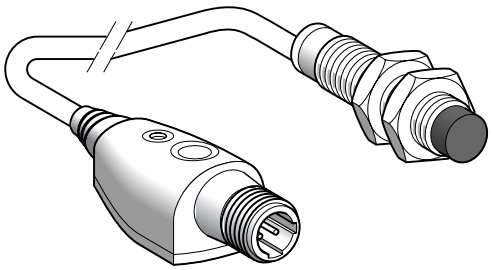
## XS range, Application

## Adjustable range sensors

Cylindrical, flush mountable using teach mode *(1)*

Three-wire DC, solid-state output

520030



*XS6●●B2●●L01M12*

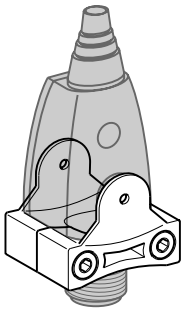
### Ø 12, threaded M12 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **5** | NO | PNP | Remote M12 connector on 0.15 m flying lead | **XS612B2PAL01M12** | 0.100 |
| | | NPN | Remote M12 connector on 0.15 m flying lead | **XS612B2NAL01M12** | 0.100 |
| | NC | PNP | Remote M12 connector on 0.15 m flying lead | **XS612B2PBL01M12** | 0.100 |
| | | NPN | Remote M12 connector on 0.15 m flying lead | **XS612B2NBL01M12** | 0.100 |

### Ø 18, threaded M18 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **9** | NO | PNP | Remote M12 connector on 0.15 m flying lead | **XS618B2PAL01M12** | 0.140 |
| | | NPN | Remote M12 connector on 0.15 m flying lead | **XS618B2NAL01M12** | 0.140 |
| | NC | PNP | Remote M12 connector on 0.15 m flying lead | **XS618B2PBL01M12** | 0.140 |
| | | NPN | Remote M12 connector on 0.15 m flying lead | **XS618B2NBL01M12** | 0.140 |

520031

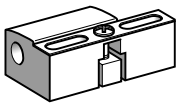


*XSZBPM12*

### Ø 30, threaded M30 x 1.5

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **18** | NO | PNP | Remote M12 connector on 0.15 m flying lead | **XS630B2PAL01M12** | 0.220 |
| | | NPN | Remote M12 connector on 0.15 m flying lead | **XS630B2NAL01M12** | 0.220 |
| | NC | PNP | Remote M12 connector on 0.15 m flying lead | **XS630B2PBL01M12** | 0.220 |
| | | NPN | Remote M12 connector on 0.15 m flying lead | **XS630B2NBL01M12** | 0.220 |

825994



*XSZB●●●*

### Accessories *(2)*

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Remote control fixing clamp** | | **XSZBPM12** | 0.015 |
| **Sensor fixing clamps** | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

*(1) For further information on flush or non flush mountable sensors using teach mode, see page 70.*

*(2) For further information, see page 118.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

## XS range, Application

## Adjustable range sensors

Cylindrical, flush mountable using teach mode
Three-wire DC, solid-state output

## Characteristics

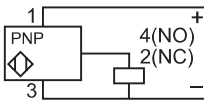
| Sensor type | | | | XS6●●B2●●L01M12 |
|---|---|---|---|---|
| **Product certifications** | | | | UL, CSA, CE |
| **Connection** | Connector | | | Remote M12 connector on 0.15 m flying lead |
| **Sensing distance and adjustment zone** | Ø 12 | Nominal sensing distance (Sn) | **mm** | **0…5** non flush mounted / **0…3.4** flush mounted |
| | | Precision adjustment zone | **mm** | **1.7…5** non flush mounted / **1.7…3.4** flush mounted |
| | Ø 18 | Nominal sensing distance (Sn) | **mm** | **0…9** non flush mounted / **0…6** flush mounted |
| | | Precision adjustment zone | **mm** | **3…9** non flush mounted / **3…6** flush mounted |
| | Ø 30 | Nominal sensing distance (Sn) | **mm** | **0…18** non flush mounted / **0…11** flush mounted |
| | | Precision adjustment zone | **mm** | **6…18** non flush mounted / **6…11** flush mounted |
| **Differential travel** | | | **%** | **1...15** of effective 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 |
| | Remote control | | | PBT |
| | Cable | | | 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 |
| **Indicators** | 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 |

## Wiring schemes

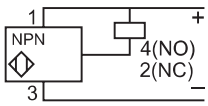
**Connector**

M12

**PNP**

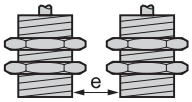


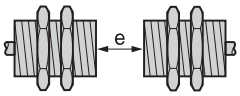

**NPN**

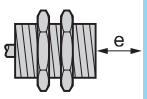



## Setting-up

**Minimum mounting distances (mm)**



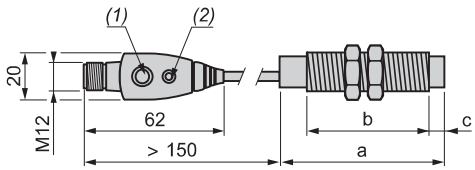




| | Side by side | | Face to face | | Facing a metal object |
|---|---|---|---|---|---|
| | flush mounted | not flush mounted | flush mounted | not flush mounted | |
| Ø 12 | e ⩾ 14 | 50 | e ⩾ 50 | 100 | e ⩾ 3.4 |
| Ø 18 | e ⩾ 28 | 100 | e ⩾ 100 | 200 | e ⩾ 6 |
| Ø 30 | e ⩾ 48 | 180 | e ⩾ 180 | 360 | e ⩾ 11 |

## Dimensions

**XS6**




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

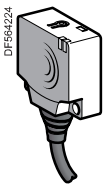
| | Connector (mm) | | |
|---|---|---|---|
| | a | b | c |
| Ø 12 | 59 | 42 | 5 |

# Inductive proximity sensors

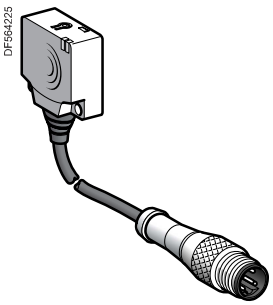
## XS range, general purpose with increased range

Flat, flush mountable using teach mode *(1)*
Two-wire AC or DC
Three-wire DC, solid-state output

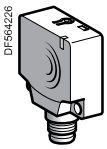
ECOLAB certified



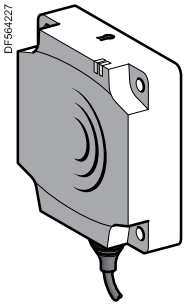

*XS8E1A1●●L2*



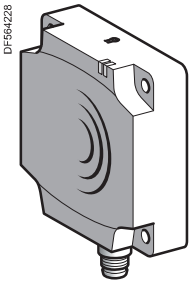

*XS8●1A1●●L01M12*
*XS8●1A1●●L01U20*



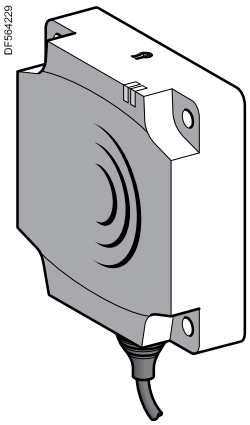

*XS8E1A1●●M8*



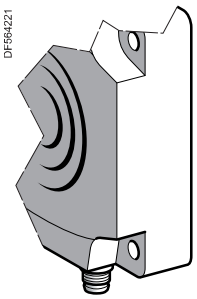

*XS8C1A1●●L2*



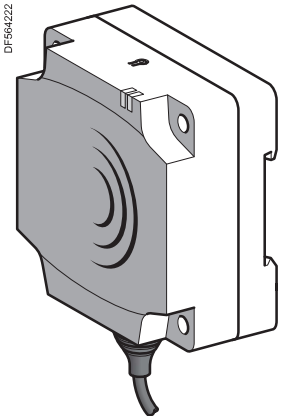

*XS8C1A1●●M8*



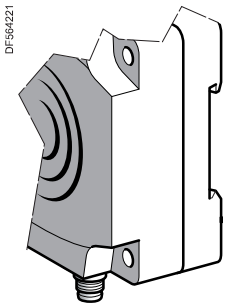

*XS8D1A1●●L2*




*XS8D1A1●●M12*




*XS8D1A1●●L2DIN*




*XS8D1A1●●M12DIN*

### Flat, 26 x 26 x 13 mm format *(2)*

| Sensing distance (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)* | **XS8E1A1PAL2** | 0.075 |
| | | | M8 connector | **XS8E1A1PAM8** | 0.040 |
| | | | Remote M12 connector | **XS8E1A1PAL01M12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS8E1A1NAL2** | 0.075 |
| | | | M8 connector | **XS8E1A1NAM8** | 0.040 |
| | | | Remote M12 connector | **XS8E1A1NAL01M12** | 0.040 |
| | NC | PNP | Pre-cabled (L = 2 m) *(3)* | **XS8E1A1PBL2** | 0.075 |
| | | | M8 connector | **XS8E1A1PBM8** | 0.040 |
| | | | Remote M12 connector | **XS8E1A1PBL01M12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS8E1A1NBL2** | 0.075 |
| | | | M8 connector | **XS8E1A1NBM8** | 0.040 |
| | | | Remote M12 connector | **XS8E1A1NBL01M12** | 0.040 |
| **Two-wire ∿ or ⎓ unprotected** *(4)* | | | | | |
| **15** | NO | – | Pre-cabled (L = 2 m) *(3)* | **XS8E1A1MAL2** | 0.070 |
| | | | Remote 1/2"-20UNF connector | **XS8E1A1MAL01U20** | 0.040 |
| | NC | – | Pre-cabled (L = 2 m) *(3)* | **XS8E1A1MBL2** | 0.070 |
| | | | Remote 1/2"-20UNF connector | **XS8E1A1MBL01U20** | 0.040 |

### Flat, 40 x 40 x 15 mm format *(2)*

| Sensing distance (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)* | **XS8C1A1PAL2** | 0.095 |
| | | | M8 connector | **XS8C1A1PAM8** | 0.060 |
| | | | Remote M12 connector | **XS8C1A1PAL01M12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS8C1A1NAL2** | 0.095 |
| | | | M8 connector | **XS8C1A1NAM8** | 0.060 |
| | | | Remote M12 connector | **XS8C1A1NAL01M12** | 0.060 |
| | NC | PNP | Pre-cabled (L = 2 m) *(3)* | **XS8C1A1PBL2** | 0.095 |
| | | | M8 connector | **XS8C1A1PBM8** | 0.060 |
| | | | Remote M12 connector | **XS8C1A1PBL01M12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS8C1A1NBL2** | 0.095 |
| | | | M8 connector | **XS8C1A1NBM8** | 0.060 |
| | | | Remote M12 connector | **XS8C1A1NBL01M12** | 0.060 |
| **Two-wire ∿ or ⎓ unprotected** *(4)* | | | | | |
| **25** | NO | – | Pre-cabled (L = 2 m) *(3)* | **XS8C1A1MAL2** | 0.090 |
| | | | Remote 1/2"-20UNF connector | **XS8C1A1MAL01U20** | 0.060 |
| | NC | – | Pre-cabled (L = 2 m) *(3)* | **XS8C1A1MBL2** | 0.090 |
| | | | Remote 1/2"-20UNF connector | **XS8C1A1MBL01U20** | 0.060 |

### Flat, 80 x 80 x 26 mm format *(2)*

| Sensing distance (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)* | **XS8D1A1PAL2** *(5)* | 0.390 |
| | | | M12 connector | **XS8D1A1PAM12** *(5)* | 0.340 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS8D1A1NAL2** *(5)* | 0.390 |
| | | | M12 connector | **XS8D1A1NAM12** *(5)* | 0.340 |
| | NC | PNP | Pre-cabled (L = 2 m) *(3)* | **XS8D1A1PBL2** *(5)* | 0.390 |
| | | | M12 connector | **XS8D1A1PBM12** *(5)* | 0.340 |
| | | NPN | Pre-cabled (L = 2 m) *(3)* | **XS8D1A1NBL2** *(5)* | 0.390 |
| | | | M12 connector | **XS8D1A1NBM12** *(5)* | 0.340 |
| **Two-wire ∿ or ⎓ unprotected** *(4)* | | | | | |
| **60** | NO | – | Pre-cabled (L = 2 m) *(3)* | **XS8D1A1MAL2** *(5)* | 0.390 |
| | | | 1/2"-20UNF connector | **XS8D1A1MAU20** *(5)* | 0.340 |
| | NC | – | Pre-cabled (L = 2 m) *(3)* | **XS8D1A1MBL2** *(5)* | 0.390 |
| | | | 1/2"-20UNF connector | **XS8D1A1MBU20** *(5)* | 0.340 |

*(1) For further information on flush or non flush mountable sensors using teach mode, see page 70.*
*(2) For accessories, see page 118.*
*(3) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **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: **XS8D1A1PAL2 DIN**.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

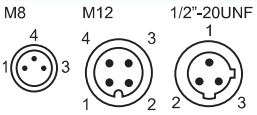
XS range, general purpose with increased range
Flat, flush mountable using teach mode *(1)*
Two-wire AC or DC
Three-wire DC, solid-state output

## Characteristics

| Sensor type | | | | XS8E●●●●●M8, XS8C●●●●●M8, XS8D●●●●●M12, XS8D●●●●●U20 | XS8E●●●●●L01M12, XS8E●●●●●L01U20, XS8C●●●●●L01M12, XS8C●●●●●L01U20 | XS8E●●●●●L2, XS8C●●●●●L2, XS8D●●●●●L2 |
|---|---|---|---|---|---|---|
| **Product certifications** | | | | UL, CSA, CE, ECOLAB | | |
| **Connection** | Connector | | | M8 except XS8●●●●●●M12: M12 XS8●●●●●●U20: 1/2"-20UNF | Remote on 0.15 m flying lead XS8●●●●●●L01M12: M12 XS8●●●●●●L01U20: 1/2"-20UNF | – |
| | Pre-cabled | | | – | – | Length: 2 m |
| **Sensing distance and adjustment zone** | XS8E | Nominal sensing dist. Sn | mm | **0…15** not flush mounted / **0…10** flush mounted | | |
| | | Fine adjustment zone | mm | **5…15** not flush mounted / **5…10** flush mounted | | |
| | XS8C | Nominal sensing dist. Sn | mm | **0…25** not flush mounted / **0…15** flush mounted | | |
| | | Fine adjustment zone | mm | **8…25** not flush mounted / **8…15** flush mounted | | |
| | XS8D | Nominal sensing dist. Sn | mm | **0…60** not flush mounted / **0…40** flush mounted | | |
| | | Fine adjustment zone | mm | **20…60** not flush mounted / **20…40** flush mounted | | |
| **Differential travel** | | | % | **1...15** of effective sensing distance (Sr) | | |
| **Degree of protection** | Conforming to IEC 60529 | | | IP 67, double insulation ⧈ (except M8 connector: IP 67) | | IP 68, ⧈ |
| **Storage temperature** | | | °C | - 40….+85 | | |
| **Operating temperature** | | | °C | - 25….+70 | | |
| **Materials** | Case | | | PBT | | |
| | Cable | | | – | 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 | | |
| **Indicators** | 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 **XS8E**, ⩽ 200 **XS8C** and **XS8D**, with overload and short-circuit protection | | |
| | 2-wire | | mA | 5…200 ∿ **XS8E**, 5…300 ∿ **XS8C** and **XS8D**, 5…200 ⎓ **XS8C** and **XS8D** | | |
| **Voltage drop, closed state** | 3-wire | | V | ⩽ 2 | | |
| | 2-wire | | V | ⩽ 5.5 | | |
| **Maximum switching frequency** | | | Hz | 2000 **XS8E**, 1000 **XS8C**, 150 **XS8D** | | |
| **Delays** | First-up | | ms | ⩽ 10 **XS8E**, **XS8C** and **XS8D** (3-wire), ⩽ 10 **XS8E** and **XS8C**, ⩽ 15 **XS8D** (2-wire) | | |
| | Response | | ms | ⩽ 0.3 | | |
| | Recovery | | ms | ⩽ 0.8 **XS8E** and **XS8C**, ⩽ 6 **XS8D** | | |

## Wiring schemes

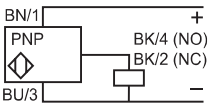
### Connector



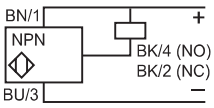

### Pre-cabled

BU: Blue
BN: Brown
BK: Black

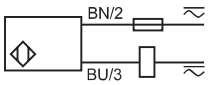
### PNP/M12 or M8




### NPN/M12 or M8




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

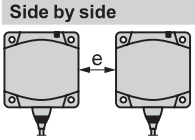



*For M8 connector, NO and NC outputs on terminal 4*

## Setting-up

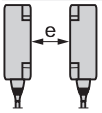
### Minimum mounting distances (mm)

**Side by side**



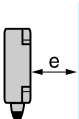

| e ⩾ | XS8E | XS8C | XS8D |
|---|---|---|---|
| Flush mounted | 40 | 60 | 200 |
| Not flush mounted | 150 | 125 | 600 |

**Face to face**




| e ⩾ | XS8E | XS8C | XS8D |
|---|---|---|---|
| Flush mounted | 80 | 120 | 400 |
| Not flush mounted | 300 | 250 | not recom-mended |

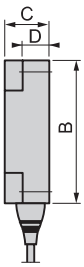
**Facing a metal object**



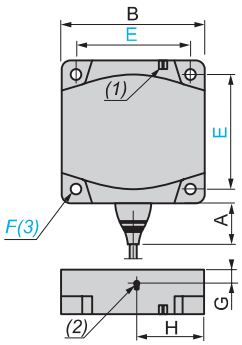

| e ⩾ | XS8E | XS8C | XS8D |
|---|---|---|---|
| | 10 | 15 | 40 |

## Dimensions

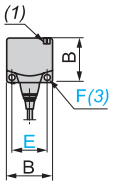
### XS8C/D/E




### XS8C/D




### XS8E




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

| Sensor | A (cable) | A (connector) | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|---|
| **XS8E** | 14 | 11 | 26 | 13 | 8.8 | **20** | **3.5** | 6.8 | 6.6 |
| **XS8C** | 14 | 11 | 40 | 15 | 9.8 | **33** | **4.5** | 8.3 | 13.6 |
| **XS8D** | 23 | 18 | 80 | 26 | 16 | **65** | **5.5** | 8.5 | 37.8 |

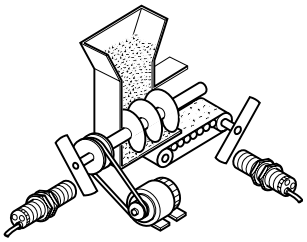
# Inductive proximity sensors

## XS range, Application

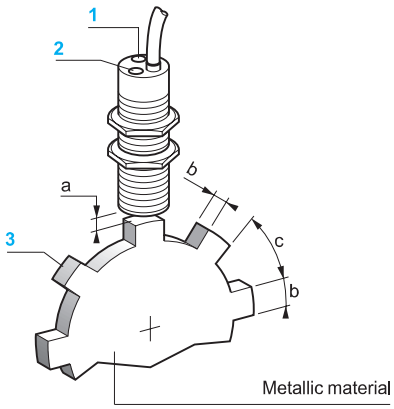
Sensors for rotation monitoring, slip detection, shaft overload detection
Cylindrical form

**Example:**
Coupling breakage monitoring

822138



DF602242




## 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 XSAV 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.*

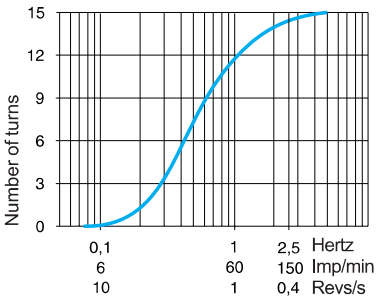
**Adjustment of frequency threshold**

- 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 (–).

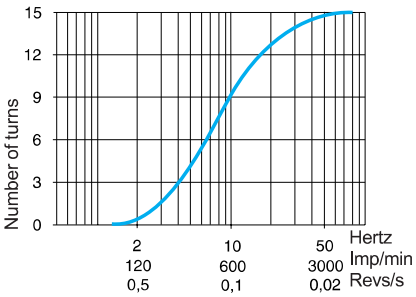
| | Diameter of sensor | | | |
|---|---|---|---|---|
| 1: Potentiometer | | a | b | c |
| 2: LED | | | | |
| 3: Metal target | M30 | 4…6 mm | 30 mm | 60 mm |

**Potentiometer adjustment curves** (for **XSAV1●801**, 2-wire ∿ or ⎓ sensors)

Low speed version (6…150 impulses/minute)



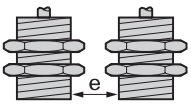

High speed version (120…3000 impulses/minute)




## Setting-up

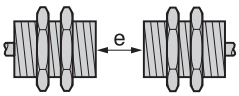
**Minimum distances (mm)**

Side by side



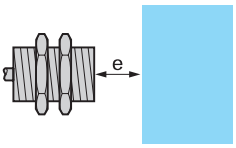

e ⩾ 20

Face to face



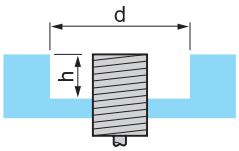

e ⩾ 120

Facing a metal object




e ⩾ 30

Mounted in a metal support




d ⩾ 30, h ⩾ 0

Fixing nut tightening torque: < 50 N.m/*442.53 lb-in*

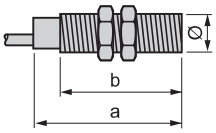
# Inductive proximity sensors

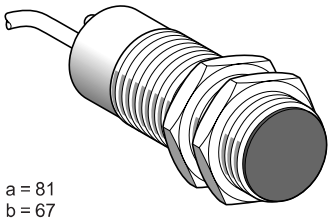
## XS range, Application

Sensors for rotation monitoring, slip detection, shaft overload detection

Cylindrical form

### Flush mountable in metal



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

a = 81
b = 67
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

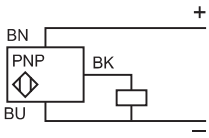
| | | | | | |
|---|---|---|---|---|---|
| **3-wire ⎓** | **PNP / NC** | **XSAV11373** | **XSAV12373** | – | – |
| **2-wire** | **⎓ or ∿ / NC** | – | – | **XSAV11801** | **XSAV12801** |
| **Weight** (kg) | | 0.300 | | | |

### Characteristics

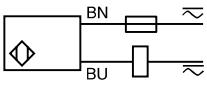
| | | |
|---|---|---|
| **Connection** | **Pre-cabled, 3 x 0.34 mm², length 2 m** *(1)* | **Pre-cabled, 2 x 0.34 mm², length 2 m** *(1)* |
| **Degree of protection** conforming to IEC 60529 | IP 67 | |
| **Operating zone** | 0…8 mm | |
| **Repeat accuracy** | 3 % of Sr | |
| **Differential travel** | 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** | 6000 impulses/min (for **XSAV11●●●**); 48,000 impulses/min (for **XSAV12●●●**) | |
| **"Run-up" delay following power-up** | 9 seconds ± 20 % + 1/Fr (3) | |

### Wiring schemes

3-wire ⎓
**XSAV1●373**




2-wire ∿ or ⎓
**XSAV1●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: XSAV11373 becomes **XSAV11373L05** 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 118.*

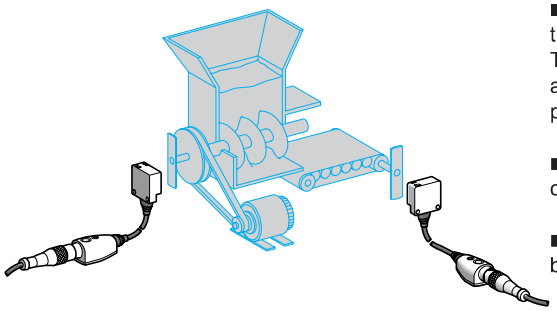
*(3) For a sensor without a "run-up" delay following power-up, replace XSAV1 in the reference by XSAV0. Example: XSAV11801 becomes **XSAV01801** without a "run-up" delay. For a reduced "run-up" delay of 3 s, replace XSAV1 in the reference by XSAV3.*

# Inductive proximity sensors

## XS range, Application

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

## Operating principle and applications

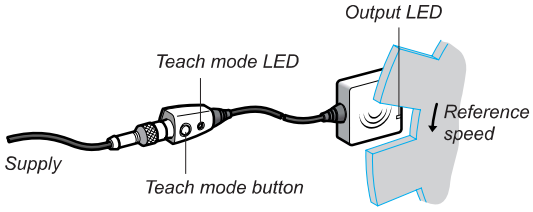


■ These inductive proximity sensors are designed for monitoring rotational speed or the speed of the flow of objects to be protected or monitored.
They operate on the principle of comparing a speed threshold preset by the operator against the instantaneous measurement of the speed of the moving object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

■ They provide a simple, economical solution for detecting slip, belt breakage, coupling breakage and overload, etc.

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

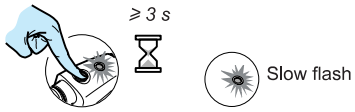
## Installation and setting-up

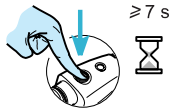



### Setting-up and positioning the sensor

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

■ Using this system, the positioning is therefore made 100 % reliable and can be checked at any time without altering the settings of the sensor.




### 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.

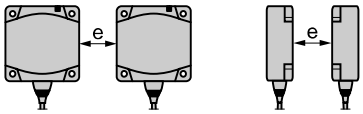
□ If in doubt, the sensor can be reset at any time to the factory settings.

*(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 on underspeed when the speed of the moving object drops below 1000 - (1000 x 0.3) = 700 rpm.*
*- 20 %, - 11 % and - 6 % thresholds can be obtained by pressing the teach mode button.*

## Setting-up

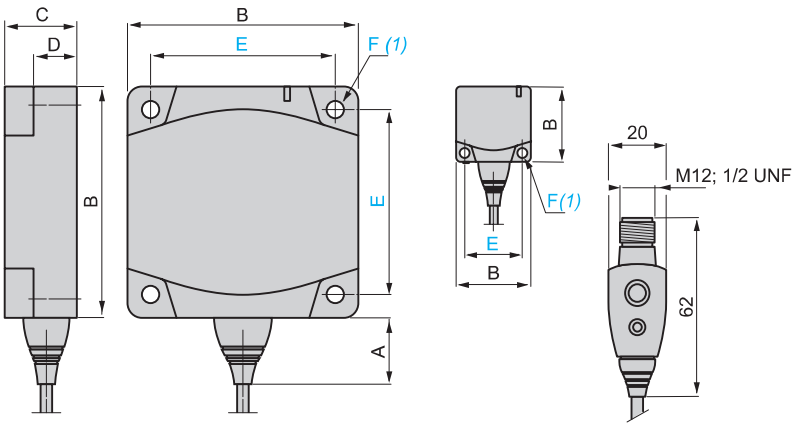
### Minimum mounting distances (mm)




| Type | Side by side | Face to face |
|---|---|---|
| **XS9E** | e ≥ 40 | e ≥ 80 |
| **XS9C** | e ≥ 60 | e ≥ 120 |

## Dimensions

### XS9E, XS9C




*(1) For CHC type screws*

| Type | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| **XS9E** | 14 | 26 | 13 | 8.8 | 20 | 3.5 |
| **XS9C** | 14 | 40 | 15 | 9.8 | 33 | 4.5 |

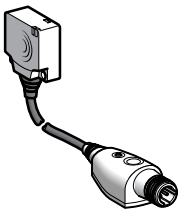
# Inductive proximity sensors

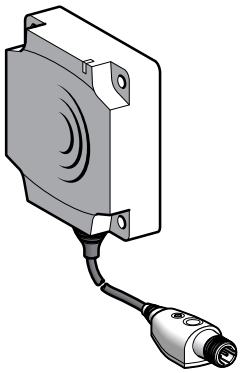
## XS range, Application

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

### Flush mountable in metal

**PBT case**



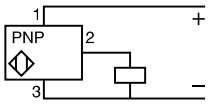


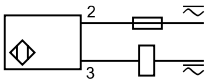
| | | | | | |
|---|---|---|---|---|---|
| **Nominal sensing distance (Sn)** | | **10 mm** | **15 mm** | **10 mm** | **15 mm** |
| **Adjustable frequency range** | | 6…6000 impulses/min | | | |
| **References** | | | | | |
| **3-wire** | PNP / NC | **XS9E11RPBL01M12** | **XS9C11RPBL01M12** | – | – |
| **2-wire** | ⎓ or ∿ / NC | – | – | **XS9E11RMBL01U20** | **XS9C11RMBL01U20** |
| **Weight (kg)** | | 0.040 | 0.060 | 0.040 | 0.060 |
| **Characteristics** | | | | | |
| **Product certifications** | | UL, CSA, CE | | | |
| **Connection** | | Remote M12 connector on 0.15 m flying lead | | Remote 1/2"-20UNF connector on 0.15 m flying lead | |
| **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** | | - 40…+ 85 °C | | | |
| **Operating temperature** | | - 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 | | | |
| **Indicators** | 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 | | | |
| **"Run-up" delay following power-up** | | 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.*

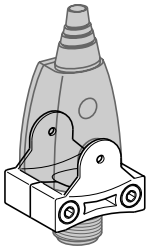
## Wiring schemes

| Connector | | 3-wire ⎓ | 2-wire ∿ or ⎓ |
|---|---|---|---|
| **M12** | **1/2"-20UNF** | **XS9●11RPBL01M12** | **XS9●11RMBL01U20** |




## Accessory *(1)*



XSZBPM12

| Description | Reference | Weight kg |
|---|---|---|
| **Remote control fixing clamp** | **XSZBPM12** | 0.015 |

*Functions, principle, curves, schemes*

# Inductive proximity sensors

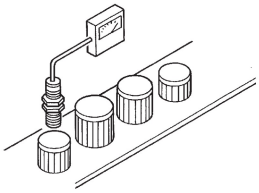
## XS range, Application

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

For position, displacement and deformation control/monitoring

## 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 many sectors, particularly for applications involving:

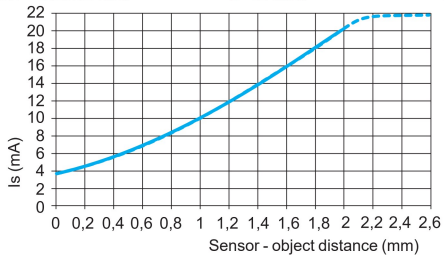
- deformation and displacement monitoring,
- vibration amplitude and frequency monitoring,
- control of dimensional tolerances,
- position control,
- concentricity or eccentricity monitoring.

## Operating principle

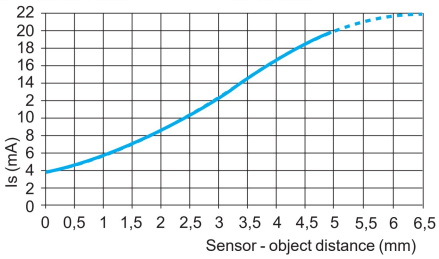
The operating principle of the sensor is that of a damped oscillator. The degree of damping will depend on the distance of an object from the sensing face. The sensor will sense the distance and produce an output current with a value directly proportional to this distance.

## Output curves 4..0.20 mA, 2-wire connection

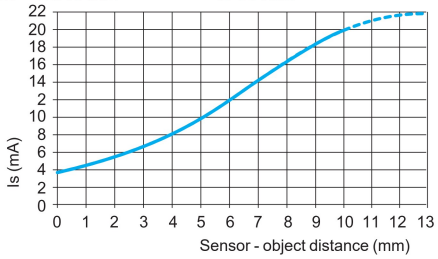
**XS1M12AB120**
Sn = 0.2…2 mm **Ø 12 mm**



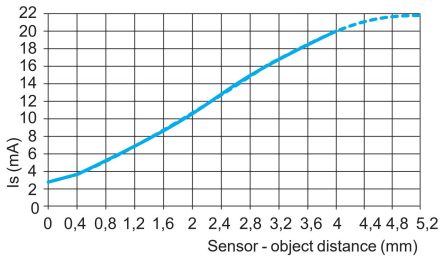

**XS1M18AB120**
Sn = 0.5…5 mm **Ø 18 mm**



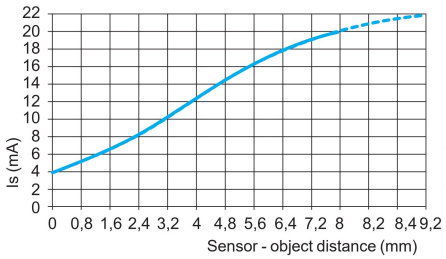

**XS1M30AB120**
Sn = 1…10 mm **Ø 30 mm**



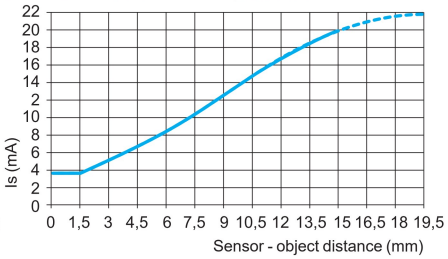

**XS4P12AB120**
Sn = 0.4…4 mm **Ø 12 mm**




**XS4P18AB120**
Sn = 0.8…8 mm **Ø 18 mm**

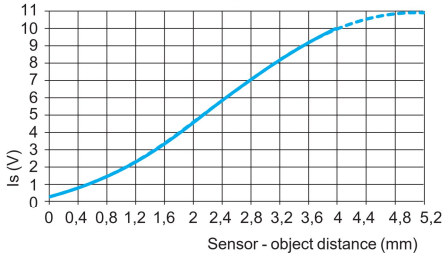



**XS4P30AB120**
Sn = 1.5…15 mm **Ø 30 mm**

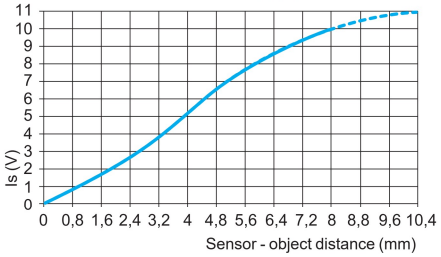



## Output curves 0...10 V, 3-wire connection

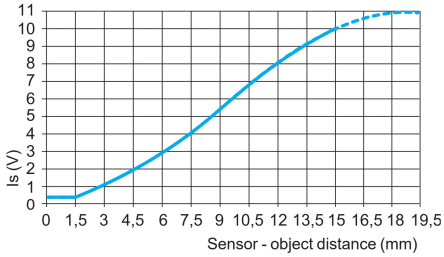
**XS4P12AB110**
Sn = 0.4…4 mm **Ø 12 mm**




**XS4P18AB110**
Sn = 0.8…8 mm **Ø 18 mm**

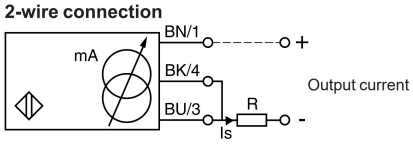



**XS4P30AB110**
Sn = 1.5…15 mm **Ø 30 mm**




## Wiring schemes

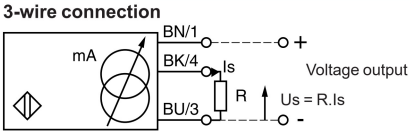
**2-wire connection**




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

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

**3-wire connection**




| | 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).

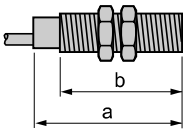
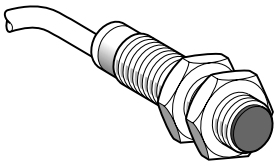
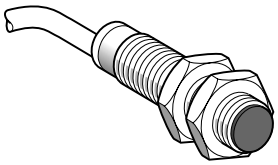
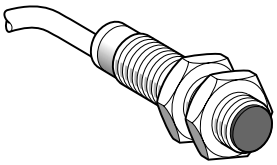
*(1) Voltage range only obtained with a load impedance of 1000 Ω.*

# Inductive proximity sensors

## XS range, Application

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

For position, displacement and deformation control/monitoring

| 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 = 54<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)* | – | – | **XS4P12AB110** |
| 2-wire ⎓ | Output 4…20 mA *(2)* | **XS1M12AB120** | **XS4P12AB120** | – |
| Weight (kg) | | 0.075 | 0.065 | 0.065 |

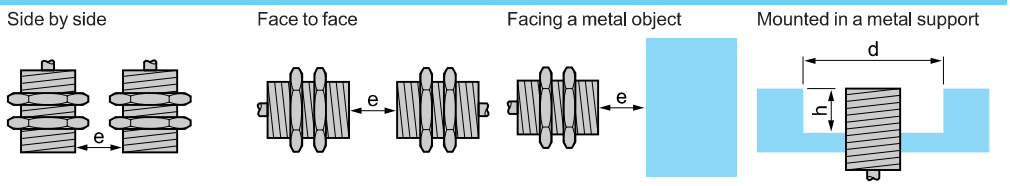
## Characteristics

| | | | |
|---|---|---|---|
| **Product certifications** | CE, UL, CSA | | |
| **Connection** | **Pre-cabled, PvR 3 x 0.34 mm², length 2 m** | | |
| **Degree of protection**<br>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…36 V | ⎓ 10…36 V | ⎓ 15…58 V |
| **Output current drift**<br>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 80.*

## Setting-up

**Minimum mounting distances (mm)**



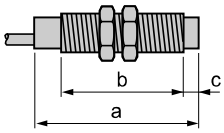
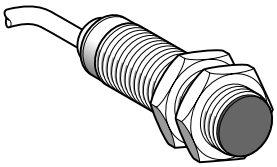
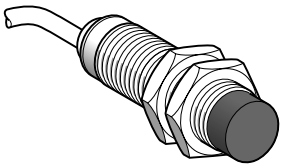
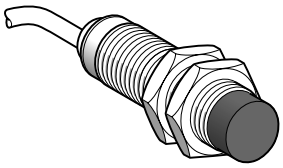

| | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| **XS1M12AB120 flush mountable** | e ⩾ 4 | e ⩾ 24 | e ⩾ 6 | d ⩾ 12, h ⩾ 0 |
| **XS4P12AB110 non flush mountable** | e ⩾ 16 | e ⩾ 48 | e ⩾ 12 | d ⩾ 36, h ⩾ 8 |
| **XS4P12AB120 non flush mountable** | 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 our Customer Care Centre. |

# Inductive proximity sensors

## XS range, 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 = 53<br>b = 44<br>c = 0 | a = 41<br>b = 26<br>c = 8 | a = 41<br>b = 26<br>c = 8 |
| | **Metal case** | **Plastic case** | **Plastic case** |
| **Nominal sensing distance** (Sn) | 5 mm | 8 mm | 8 mm |

## References

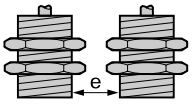
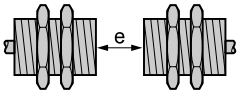
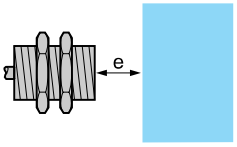
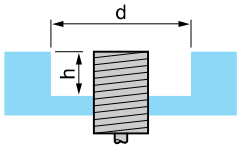
| | | | | |
|---|---|---|---|---|
| 3-wire ⎓ | Output 0…10 V *(2)* | – | – | **XS4P18AB110** |
| 2-wire ⎓ | Output 4…20 mA *(2)* | **XS1M18AB120** | **XS4P18AB120** | – |
| Weight (kg) | | 0.120 | 0.080 | 0.080 |

## Characteristics

| | | | |
|---|---|---|---|
| **Product certifications** | CE, UL, CSA | | |
| **Connection** | **Pre-cabled, PvR 3 x 0.34 mm², length 2 m** | | |
| **Degree of protection**<br>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…36 V | ⎓ 10…36 V | ⎓ 15…58 V |
| **Output current drift**<br>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 80.*

## Setting-up

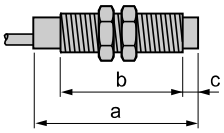
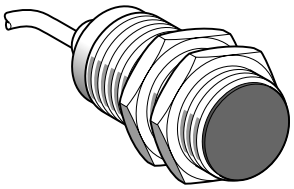
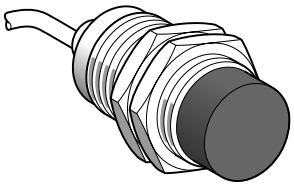
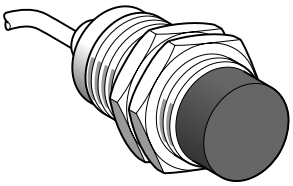
| **Minimum mounting distances (mm)** | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| |  |  |  |  |
| **XS1M18AB120 flush mountable** | e ⩾ 10 | e ⩾ 60 | e ⩾ 15 | d ⩾ 18, h ⩾ 0 |
| **XS4P18AB110 non flush mountable** | e ⩾ 32 | e ⩾ 96 | e ⩾ 24 | d ⩾ 54, h ⩾ 16 |
| **XS4P18AB120 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 our Customer Care Centre. |

# Inductive proximity sensors

## XS range, 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 | <br>a = 50<br>b = 42<br>c = 0 | <br>a = 53<br>b = 32<br>c = 13 | <br>a = 53<br>b = 32<br>c = 13 |
| | **Metal case** | **Plastic case** | **Plastic case** |
| **Nominal sensing distance** (Sn) | 10 mm | 15 mm | 15 mm |

## References

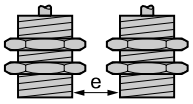
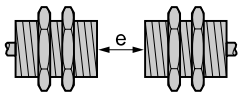
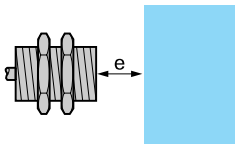
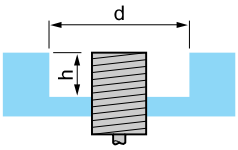
| | | | |
|---|---|---|---|
| 3-wire ⎓ Output 0…10 V *(2)* | – | – | **XS4P30AB110** |
| 2-wire ⎓ Output 4…20 mA *(2)* | **XS1M30AB120** | **XS4P30AB120** | – |
| Weight (kg) | 0.200 | 0.100 | 0.100 |

## Characteristics

| | | | |
|---|---|---|---|
| **Product certifications** | CE, UL, CSA | | |
| **Connection** | **Pre-cabled, PvR 3 x 0.34 mm², length 2 m** | | |
| **Degree of protection**<br>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…36 V | ⎓ 10…36 V | ⎓ 15…58 V |
| **Output current drift**<br>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 80.*

## Setting-up

| **Minimum mounting distances (mm)** | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| |  |  |  |  |
| **XS1M30AB120 flush mountable** | e ⩾ 20 | e ⩾ 120 | e ⩾ 30 | d ⩾ 30, h ⩾ 0 |
| **XS4P30AB110 non flush mountable** | e ⩾ 60 | e ⩾ 180 | e ⩾ 45 | d ⩾ 90, h ⩾ 30 |
| **XS4P30AB120 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 our Customer Care Centre. |

*Functions, principle, curves, schemes*

# Inductive proximity sensors

## XS range, Application

Sensors with analogue output signal 0…10 V *(1)*
For position, displacement and deformation control/monitoring

## 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 many sectors, particularly for applications involving:**

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

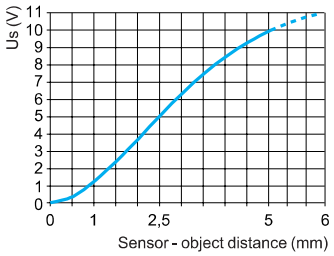
## Operating principle

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

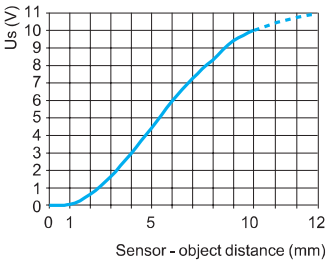
### XS9F

Sn = 1…5 mm



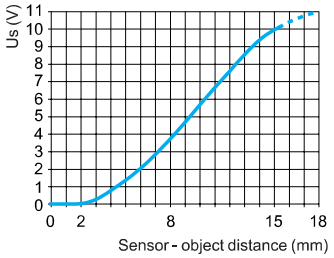

### XS9E

Sn = 1…10 mm



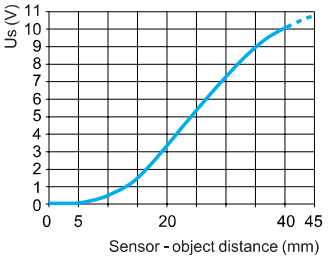

### XS9C

Sn = 2…15 mm




### XS9D

Sn = 5…40 mm




## Wiring schemes

### Connector

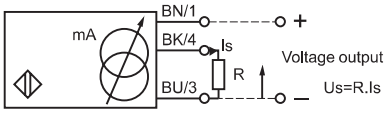
M8

M12

### 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

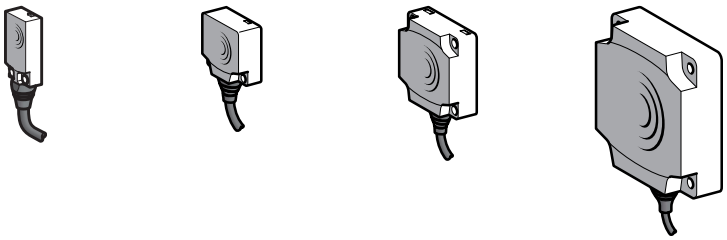
## XS range, Application

Sensors with analogue output signal 0…10 V *(1)*
For position, displacement and deformation control/monitoring

**Flush mountable in metal**

ECOLAB® certified

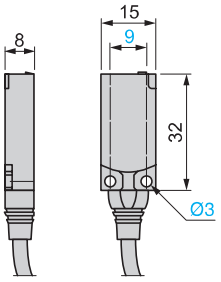
**PBT case**



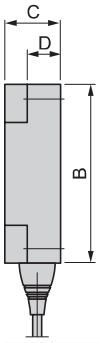
| **Nominal sensing distance (Sn)** | | **5 mm** | **10 mm** | **15 mm** | **40 mm** |
|---|---|---|---|---|---|
| **References** | | | | | |
| **3-wire ⎓** 0…10 V | Pre-cabled (L = 2 m) *(2)* | **XS9F111A1L2** | **XS9E111A1L2** | **XS9C111A1L2** | **XS9D111A1L2** |
| | Connector | **XS9F111A1L01M8** | **XS9E111A1L01M12** | **XS9C111A1L01M12** | **XS9D111A1M12** |
| **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 | UL, CSA, CE, ECOLAB | | |
| **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

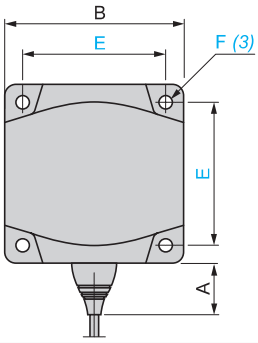
**XS9F**



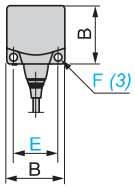

**XS9E/C/D**




**XS9C/D**



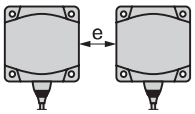
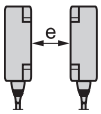
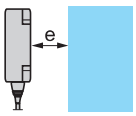

**XS9E**




*(3) For CHC type screws*

| Type | A (L2) | A (M12) | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| **XS9E** | 14 | – | 26 | 13 | 8.8 | 20 | 3.5 |
| **XS9C** | 14 | – | 40 | 15 | 9.8 | 33 | 4.5 |
| **XS9D** | 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 | |
|---|---|---|---|---|---|---|
| **XS9F** |  | e ≥ 15 |  | e ≥ 36 |  | e ≥ 15 |
| **XS9E** | | e ≥ 30 | | e ≥ 72 | | e ≥ 30 |
| **XS9C** | | e ≥ 45 | | e ≥ 110 | | e ≥ 45 |
| **XS9D** | | 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: XS9C111A1L2 becomes **XS9C111A1L5** with a 5 m long cable.*

*Functions, principle, curves, schemes*

# Inductive proximity sensors

## XS range, Application

Sensors with analogue output signal 4…20 mA
For position, displacement and deformation control/monitoring

## 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 many sectors, particularly for applications involving:**

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

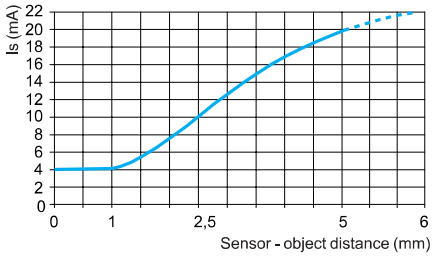
## Operating principle

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

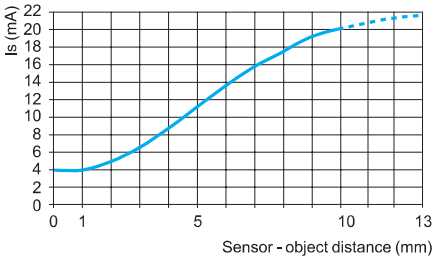
### XS9F

**Sn = 1…5 mm**



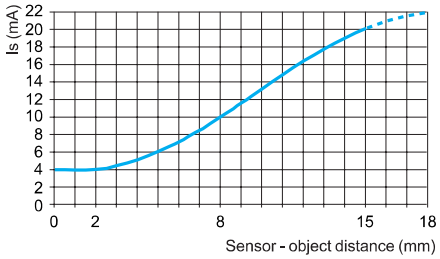

### XS9E

**Sn = 1…10 mm**



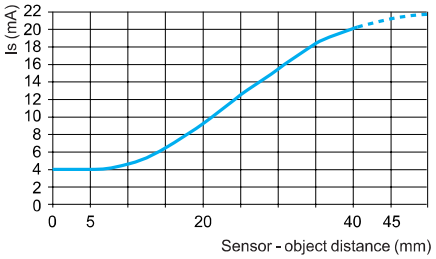

### XS9C

**Sn = 2…15 mm**



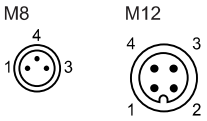

### XS9D

**Sn = 5…40 mm**




## Wiring schemes

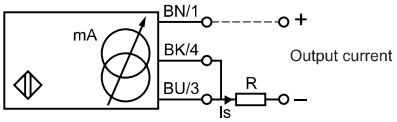
### Connector




### 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

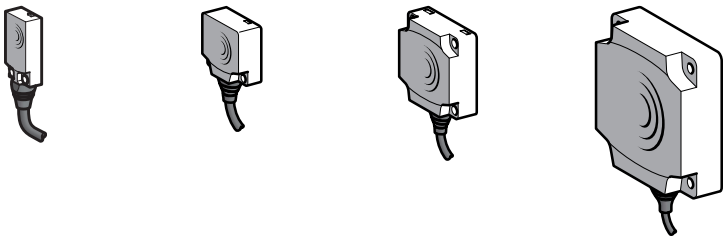
## XS range, Application

Sensors with analogue output signal 4…20 mA
For position, displacement and deformation control/monitoring

**Flush mountable in metal**

ECOLAB® certified

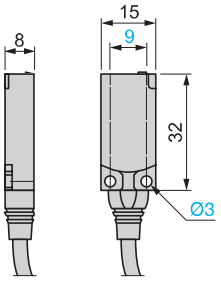
**PBT case**



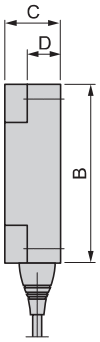
| **Nominal sensing distance (Sn)** | | **5 mm** | **10 mm** | **15 mm** | **40 mm** |
|---|---|---|---|---|---|
| **References** | | | | | |
| **2-wire ⎓** 4…20 mA | Pre-cabled (L = 2 m) *(1)* | **XS9F111A2L2** | **XS9E111A2L2** | **XS9C111A2L2** | **XS9D111A2L2** |
| | Connector | **XS9F111A2L01M8** | **XS9E111A2L01M12** | **XS9C111A2L01M12** | **XS9D111A2M12** |
| **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 | UL, CSA, CE, ECOLAB | | |
| **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…+ 60 °C | - 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

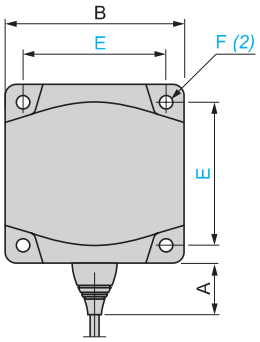
**XS9F**



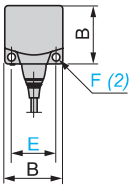

**XS9E/C/D**




**XS9C/D**



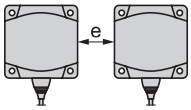
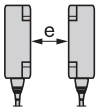
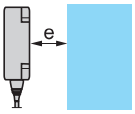

**XS9E**




*(2) For CHC type screws*

| Type | A (L2) | A (M12) | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| **XS9E** | 14 | – | 26 | 13 | 8.8 | 20 | 3.5 |
| **XS9C** | 14 | – | 40 | 15 | 9.8 | 33 | 4.5 |
| **XS9D** | 23 | 14 | 80 | 26 | 16 | 65 | 5.5 |

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

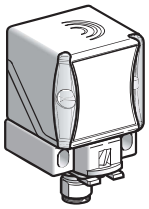
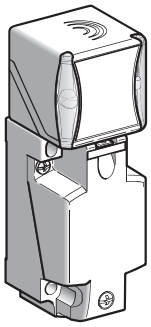
| Type | Side by side | | Face to face | | Facing a metal object | |
|---|---|---|---|---|---|---|
| **XS9F** |  | e ≥ 15 |  | e ≥ 36 |  | e ≥ 15 |
| **XS9E** | | e ≥ 30 | | e ≥ 72 | | e ≥ 30 |
| **XS9C** | | e ≥ 45 | | e ≥ 110 | | e ≥ 45 |
| **XS9D** | | e ≥ 120 | | e ≥ 300 | | e ≥ 120 |

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: XS9F111A2L2 becomes **XS9F111A2L5** with a 5 m long cable.*

# Inductive proximity sensors

## XS range, Application

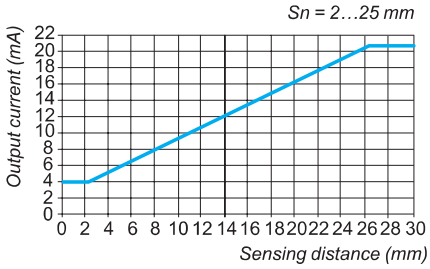
Sensors with analogue output signal 0…10 V *(1)* or 4…20 mA. Plastic case, 40 x 40 mm front face 5 position turret head

| **Sensor** | | **Non flush mountable in metal** | |
|---|---|---|---|
| **Dimensions** | | **40 x 40 x 70 mm** | **40 x 40 x 117 mm** |
| | |  |  |
| **Nominal sensing distance (Sn)** | | 25 mm | |
| **References** | | | |
| **3-wire ⎓** | 0…10 V output *(1)* | **XS9C2A2A1M12** | **XS9C4A2A1P20** *(2)* |
| **2-wire ⎓** | 4…20 mA output | **XS9C2A2A2M12** | **XS9C4A2A2P20** *(2)* |
| | | **XS9C4●●●P20** sensors are available with an ISO M20 cable entry and can be supplied with a PG 13.5 (e.g. **XS9C4A2A1G13**) or a 1/2" NPT (e.g. **XS9C4A2A2N12**) cable entry: please consult our Customer Care Centre for more information. | |
| **Weight (kg)** | | 0.149 | 0.244 |
| **Characteristics** | | | |
| **Product certifications** | | UL, CSA, CE | |
| **Conformity to standards** | | IEC 60947-5-2 and IEC 60947-5-7 | |
| **Connection** | | M12 connector (4-pin) | Screw terminals, clamping capacity 3 x 1.5 mm$^2$ / 3 x 16 AWG |
| **Operating zone** | | 2…27 mm | |
| **Linearity error** | | < 3% | |
| **Repeat accuracy** | | < 3% | |
| **Output current drift** | | < 5% | |
| **Degree of protection** | Conforming to IEC 60529 and DIN 40050 | IP 65, IP 67 and IP 69K | |
| **Temperature** | Storage | - 40….+ 85°C | |
| | Operation *(3)* | - 25….+ 70°C | |
| **Material** | | Case: PBT | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | 25 gn, amplitude ± 2 mm (f = 10…55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | 50 gn for 11 ms | |
| **Indicators** | Output state (alignment aid) | Yellow LED | |
| **Rated supply voltage** | 4...20 mA | ⎓ 12…24 V with protection against reverse polarity | |
| | 0...10 V | ⎓ 24 V with protection against reverse polarity | |
| **Voltage limits (including ripple)** | 4...20 mA | ⎓ 12…36 V | |
| | 0...10 V | ⎓ 15…36 V | |
| **Current consumption, no-load** | 3-wire ⎓ | < 4 mA | |
| **Delays** | First-up | < 7 ms | |
| | Response | < 6 ms | |
| | Recovery | < 6 ms | |

## Analogue outputs 4-20 mA and 0-10 V

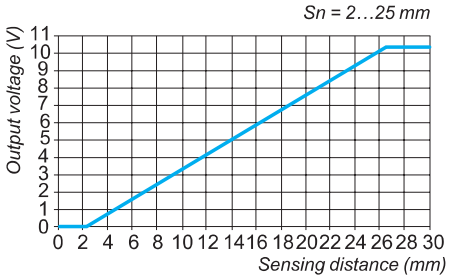
**XS9C2A2A2M12** and **XS9C4A2A2P20**

*Sn = 2…25 mm*




**XS9C2A2A1M12** and **XS9C4A2A1P20**

*Sn = 2…25 mm*




*(1) Voltage range only obtained with a load impedance of 1000 Ω.*
*(2) These sensors are supplied without a cable gland. An adaptable PG 13.5 cable gland is available (reference* **XSZPE13***).*
*(3) Sensors are available for very low temperatures (suffix* **TF***: - 40°C + 70°C) or very high temperatures (suffix* **TT***: - 25°C + 85°C): please consult our Customer*

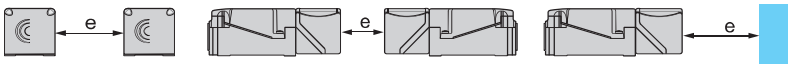
# Inductive proximity sensors

XS range, Application

Sensors with analogue output signal 0…10 V *(1)* or 4…20 mA. Plastic case, 40 x 40 mm front face 5 position turret head

## Setting-up precautions

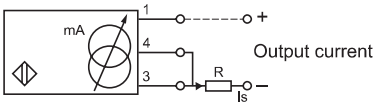
**Minimum mounting distances (mm)**




| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| **Sensors non flush mountable in metal** | e ⩾ 120 | e ⩾ 240 | e ⩾ 90 |

## Wiring schemes

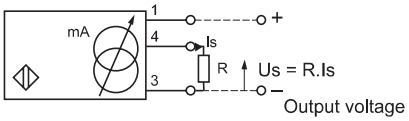
**2-wire**




| | Output current | Load impedance value |
|---|---|---|
| 12 V | 4...20 mA | R ⩽ 82 Ω |
| 24 V | 4...20 mA | R ⩽ 560 Ω |

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

**3-wire**

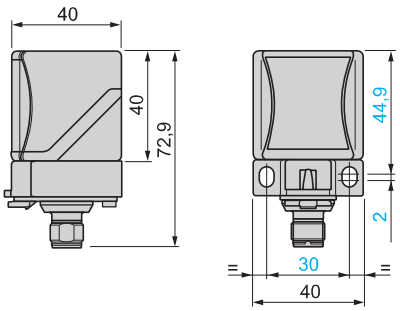



| | Output current | Load impedance value | Output voltage | Load impedance value |
|---|---|---|---|---|
| 12 V | 0...10 mA | R ⩽ 630 Ω | – | – |
| 24 V | 0...10 mA | R ⩽ 1500 Ω | 0...10 V | R = 1000 Ω |

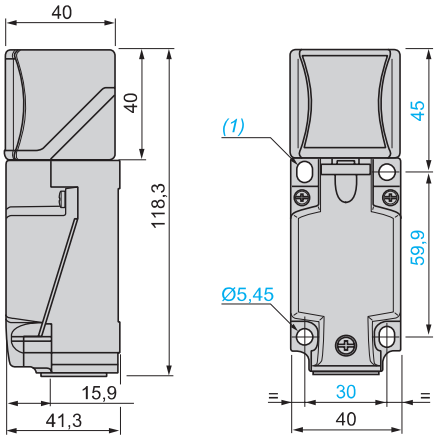
Ensure a minimum of 5 V between the + and the sensor output (terminal 4).

## Dimensions

**XS9C2A2A1M12** and **XS9C2A2A2M12**



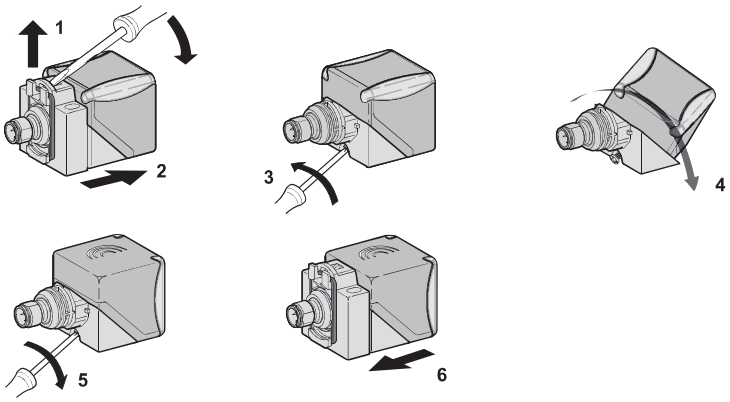

**XS9C4A2A1P20** and **XS9C4A2A2P20**



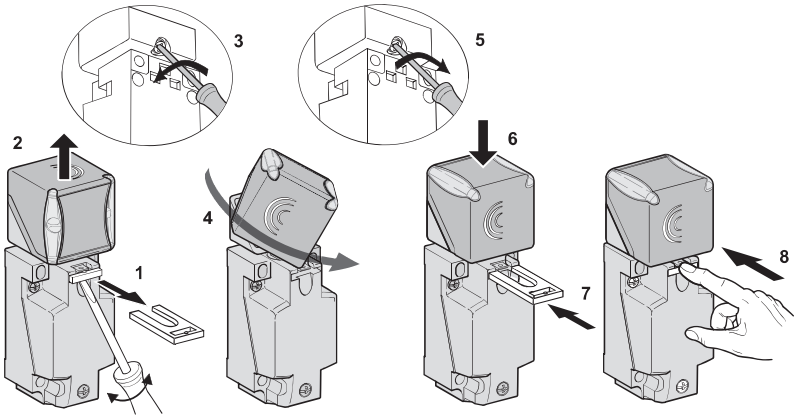

*(1) 2 elongated holes Ø 5.3 x 7 mm.*
*Tightening torque of cover fixing screws and clamp screws: < 1.2 N.m / < 10.62 lb-in*

## Head positions

**XS9C2A2A1M12** and **XS9C2A2A2M12**




**XS9C4A2A1P20** and **XS9C4A2A2P20**




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

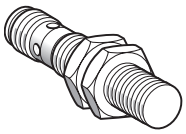
# Inductive proximity sensors

## XS range, Application

Cylindrical, stainless steel 316L front face
for food and beverage applications and harsh industrial environments. Three-wire DC, solid-state output

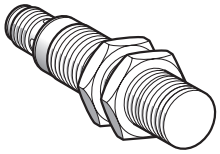
ECOLAB® certified

DF513369



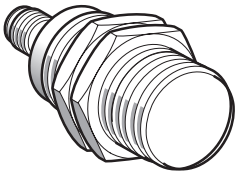
*XS912●1PAM12*

DF513373



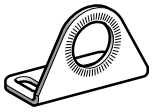
*XS918●1PAM12*

DF513380



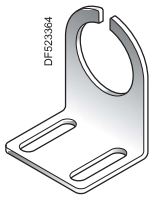
*XS930●1PAM12*

805817



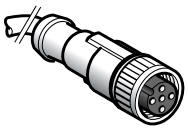
*XUZA118*

DF523364



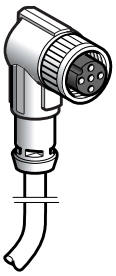
*XSZBS30*

DF532604



*XZCP1141L●*

DF503630



*XZCP1241L●*

### Ø 12 mm, threaded M12 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Three-wire 12-24V ⎓, flush mountable** | | | | | |
| 6 | NO | PNP | M12 | **XS912S1PAM12** | 0.024 |
| **Three-wire 12-24V ⎓, non flush mountable** | | | | | |
| 10 | NO | PNP | M12 | **XS912S4PAM12** | 0.023 |

### Ø 18 mm, threaded M18 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Three-wire 12-24V ⎓, flush mountable** | | | | | |
| 10 | NO | PNP | M12 | **XS918S1PAM12** | 0.051 |
| **Three-wire 12-24V ⎓, non flush mountable** | | | | | |
| 20 | NO | PNP | M12 | **XS918S4PAM12** | 0.051 |

### Ø 30 mm, threaded M30 x 1.5

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Three-wire 12-24V ⎓, flush mountable** | | | | | |
| 20 | NO | PNP | M12 | **XS930S1PAM12** | 0.140 |
| **Three-wire 12-24V ⎓, non flush mountable** | | | | | |
| 40 | NO | PNP | M12 | **XS930S4PAM12** | 0.145 |

### Accessories

| Description | For use with sensor | Reference | Weight kg |
|---|---|---|---|
| Stainless steel mounting bracket | Ø 12 | **XSZBS12** | 0.090 |
| | Ø 18 | **XUZA118** | 0.190 |
| | Ø 30 | **XSZBS30** | 0.370 |

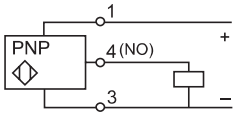
### Connecting cables (PVC) *(1)*

| Description | Type | Length m | Reference | Weight kg |
|---|---|---|---|---|
| **Pre-wired M12 connectors** Female, 4-pin Stainless steel clamping ring | Straight | 2 | **XZCPA1141L2** | 0.090 |
| | | 5 | **XZCPA1141L5** | 0.190 |
| | | 10 | **XZCPA1141L10** | 0.370 |
| | Elbowed | 2 | **XZCPA1241L2** | 0.090 |
| | | 5 | **XZCPA1241L5** | 0.190 |
| | | 10 | **XZCPA1241L10** | 0.370 |

### Wiring schemes

**M12 connector**

**PNP**




*(1) For further information, please consult our site www.tesensors.com.*

*Characteristics, setting-up, dimensions*

# Inductive proximity sensors

## XS range, Application

Cylindrical, stainless steel 316L front face for food and beverage applications and harsh industrial environments. Three-wire DC, solid-state output

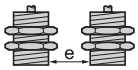
## Characteristics

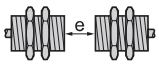
| Sensor type | Flush | | XS912S1PAM12 | XS918S1PAM12 | XS930S1PAM12 |
|---|---|---|---|---|---|
| | Non flush | | XS912S4PAM12 | XS918S4PAM12 | XS930S4PAM12 |
| **Product certifications** | | | CE, cULus, ECOLAB | | |
| **Connection** | Connector | | M12 | | |
| **Operating zone** | Flush | mm | 0…4.8 | 0…8 | 0…16 |
| | Non flush | mm | 0…8 | 0…16 | 0…32 |
| **Differential travel** | | % | 1…15 (real sensing distance Sr) | | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 68 (5 meters underwater for 1 month) | | |
| | Conforming to DIN 40050 | | IP 69K | | |
| **Storage temperature** | | °C | -25…+ 85 (-13…185°F) | | |
| **Operating temperature** | | °C | -25…+ 85 (-13…185°F) | | |
| **Materials** | Case | | Stainless steel 316L | | |
| **Front face thickness** | | mm | 0.4 | 0.6 | 1.0 |
| **Mechanical shock resistance** | Conforming to IEC 62262 | | IK10 | | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 1 mm (f = 10 to 55 Hz) | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 30 gn, duration 11 ms | | |
| **Output state indication** | | | Yellow LED, 4 viewing points at 90° (blinking from 0.8 Sr and Sr) | | |
| **Rated supply voltage** | | V | ⎓ 12…24 with protection against reverse polarity | | |
| **Voltage limits (including ripple)** | | V | ⎓ 10…30 | | |
| **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** | Flush | Hz | 600 | 300 | 100 |
| | Non flush | Hz | 400 | 200 | 90 |
| **Delays** | First set-up | ms | 40 | | |
| | Response | µs | 0.06 | | |
| | Recovery | µs | 15 | | |

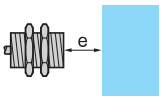
## Setting-up

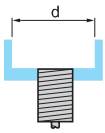
### Minimum mounting distances in mm, flush version

| Side by side | | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| Ø 12 | e ≥ 38 | e ≥ 30 | e ≥ 20 | d ≥ 24 |
| Ø 18 | e ≥ 42 | e ≥ 40 | e ≥ 30 | d ≥ 50 |
| Ø 30 | e ≥ 80 | e ≥ 70 | e ≥ 60 | d ≥ 90 |



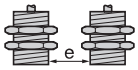



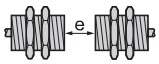



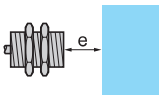



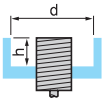

### Minimum mounting distances in mm, non flush version

| Side by side | | Face to face | Facing a metal object | Mounted in a metal support | |
|---|---|---|---|---|---|
| Ø 12 | e ≥ 108 | e ≥ 40 | e ≥ 30 | d ≥ 30 | h ≥ 22 |
| Ø 18 | e ≥ 182 | e ≥ 70 | e ≥ 60 | d ≥ 60 | h ≥ 34 |
| Ø 30 | e ≥ 270 | e ≥ 130 | e ≥ 120 | d ≥ 120 | h ≥ 34 |

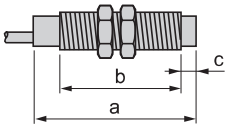



## Dimensions




Lengths (mm):
a = overall
b = threaded
c = for non flush mountable sensors

| | Flush sensor | | | Non flush sensor | | |
|---|---|---|---|---|---|---|
| | M12 | M18 | M30 | M12 | M18 | M30 |
| a (mm) | 60 | 63.5 | 63.5 | 60 | 63.5 | 63.5 |
| b (mm) | 41 | 42 | 42 | 36 | 35 | 32 |
| c (mm) | 0 | 0 | 0 | 5 | 7 | 10 |

## Reduction coefficient

### Flush-non mounted

| | | Flush sensor | | | Non flush sensor | | |
|---|---|---|---|---|---|---|---|
| | | M12 | M18 | M30 | M12 | M18 | M30 |
| Steel | | 1 | 1 | 1 | 1 | 1 | 1 |
| Aluminum | | 1 | 1 | 1 | 1 | 1 | 1 |
| Brass | | 1.3 | 1.2 | 1.3 | 1.4 | 1.35 | 1.2 |
| Cupper | | 0.85 | 0.8 | 0.9 | 0.8 | 0.9 | 0.9 |
| Stainless steel | Thickness 1 mm | 0.5 | 0.5 | 0.35 | *(1)* | 0.3 | *(1)* |
| | Thickness 2 mm | 0.9 | 0.9 | 0.7 | 0.66 | 0.6 | 0.25 |

*(1) No detection.*

### Flush mounted

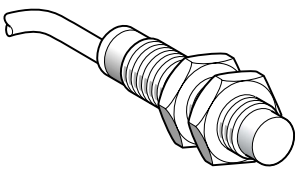
| | M12 | M18 | M30 |
|---|---|---|---|
| Steel | 0.7 | 0.75 | 0.9 |
| Aluminum | 1.15 | 0.9 | 0.7 |
| Brass | 1.05 | 0.75 | 0.6 |
| Stainless steel | 0.8 | 0.8 | 1.3 |

# Inductive proximity sensors

## XS range, Application, food and beverage processing series

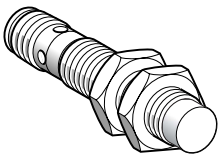
Cylindrical, stainless steel, non flush mountable
Three-wire DC, solid-state output

DF532016



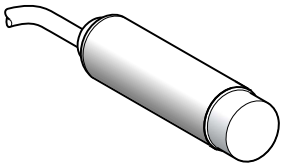
*XS2●●SA●●L2*

DF532015



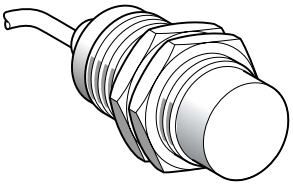
*XS2●●SA●●M12*

534440



*XS2L2SA●●L2*

822116

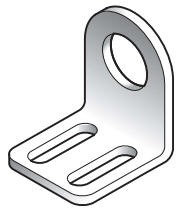


*XS230SA●●L2*

503663

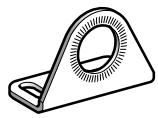
*XUZB2005*

523363



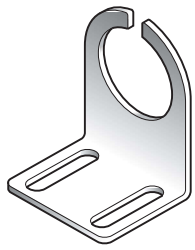
*XSZBS12*

805817



*XUZA118*

523364



*XSZBS30*

### Ø 12, threaded M12 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **7** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS212SAPAL2** | 0.075 |
| | | | M12 connector | **XS212SAPAM12** | 0.035 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS212SANAL2** | 0.075 |
| | | | M12 connector | **XS212SANAM12** | 0.035 |

### Ø 18, threaded M18 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **12** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS218SAPAL2** | 0.120 |
| | | | M12 connector | **XS218SAPAM12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS218SANAL2** | 0.120 |
| | | | M12 connector | **XS218SANAM12** | 0.060 |

### Ø 18, plain

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **12** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS2L2SAPAL2** | 0.120 |
| | | | M12 connector | **XS2L2SAPAM12** | 0.060 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS2L2SANAL2** | 0.120 |
| | | | M12 connector | **XS2L2SANAM12** | 0.060 |

### Ø 30, threaded M30 x 1.5

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **22** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS230SAPAL2** | 0.205 |
| | | | M12 connector | **XS230SAPAM12** | 0.145 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS230SANAL2** | 0.205 |
| | | | M12 connector | **XS230SANAM12** | 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 | **XUZB2005** | 0.007 |
| **Stainless steel fixing bracket** | Ø 12 sensor | **XSZBS12** | 0.060 |
| | Ø 18 sensor | **XUZA118** | 0.045 |
| | Ø 30 sensor | **XSZBS30** | 0.080 |

### Connecting cables

| Description | Type | Length m | Reference | Weight kg |
|---|---|---|---|---|
| **Pre-wired M12 connectors** Female, 4-pin, stainless steel clamping ring | Straight | 2 | **XZCPA1141L2** | 0.090 |
| | | 5 | **XZCPA1141L5** | 0.210 |
| | | 10 | **XZCPA1141L10** | 0.410 |
| | Elbowed | 2 | **XZCPA1241L2** | 0.090 |
| | | 5 | **XZCPA1241L5** | 0.210 |
| | | 10 | **XZCPA1241L10** | 0.410 |
| **M12 jumper cable** Male, 3-pin, stainless steel clamping ring | Straight | 2 | **XZCRA151140A2** | 0.095 |
| | | 5 | **XZCRA151140A5** | 0.200 |

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS212SAPAL2** becomes **XS212SAPAL5** with a 5 m long cable.*
*(2) For further information, see page 118.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

## XS range, Application, food and beverage processing series

Cylindrical, stainless steel, non flush mountable
Three-wire DC, solid-state output

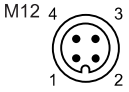
## Characteristics

| 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 effective 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 *(1)* | |
| **Operating temperature** | | °C | - 25…+ 85 | |
| **Materials** | Case | | Stainless steel 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** | **XS212SA●●●●** | Hz | 2500 | |
| | **XS218SA●●●●** and **XS2L2●●●●** | Hz | 1000 | |
| | **XS230SA●●●●** | Hz | 500 | |
| **Delays** | First-up | ms | ≤ 10 | |
| | Response | ms | ≤ 0.2 Ø 12, ≤ 0.3 Ø 18, ≤ 0.6 Ø 30 | |
| | Recovery | ms | ≤ 0.2 Ø 12, ≤ 0.7 Ø 18, ≤ 1.4 Ø 30 | |

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

## Wiring schemes

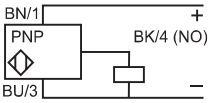
### Connector



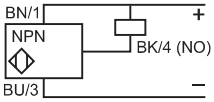

### Pre-cabled

BU: Blue
BN: Brown
BK: Black

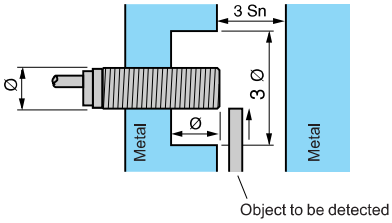
### PNP



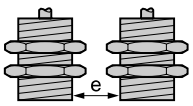

### NPN

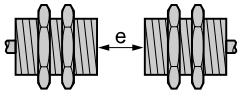


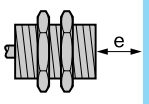

## Setting-up




### Minimum mounting distances (mm)



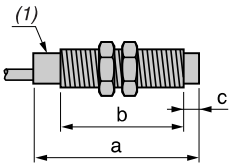




| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 12 | e ≥ 48 | e ≥ 84 | e ≥ 21 |
| Ø 18 | e ≥ 72 | e ≥ 144 | e ≥ 36 |
| Ø 30 | e ≥ 120 | e ≥ 264 | e ≥ 66 |

## Dimensions

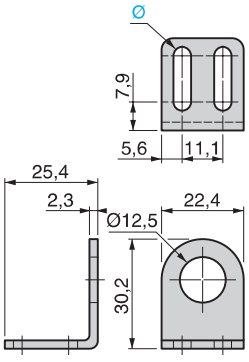
### XS2



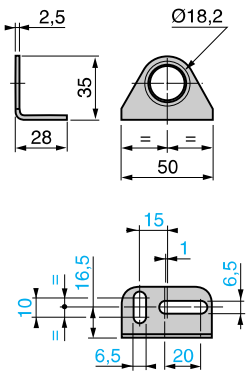

*(1) LED*

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

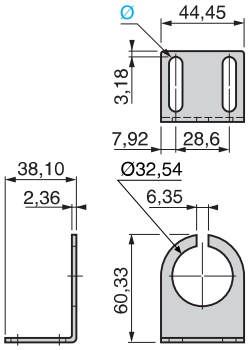
### XSZBS12




### XUZA118



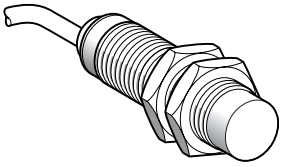

### XSZBS30



# Inductive proximity sensors

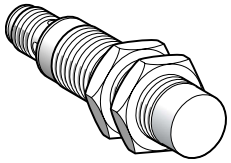
XS range, Application
Food and beverage processing series
Cylindrical, stainless steel, non flush mountable
Two-wire AC or DC

523361



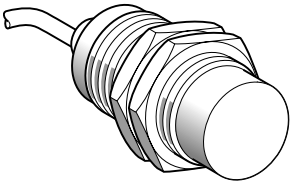
*XS218SAM●L2*

523362



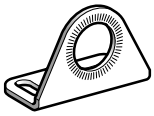
*XS218SAM●U20*

523218



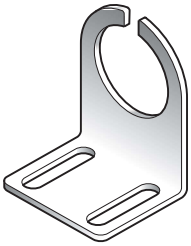
*XS230SAM●L2*

805817



*XUZA118*

523364



*XSZBS30*

## Ø 18, threaded M18 x 1

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **12** | NO | Pre-cabled (L = 2 m) *(1)* | **XS218SAMAL2** | 0.120 |
| | | 1/2"-20UNF connector | **XS218SAMAU20** | 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)* | **XS230SAMAL2** | 0.205 |
| | | 1/2"-20UNF connector | **XS230SAMAU20** | 0.145 |

## Connecting cables

| Description | Type | Length m | Reference | Weight kg |
|---|---|---|---|---|
| **Pre-wired connectors** 1/2"-20UNF 3-pin female, stainless steel clamping ring | Straight | 5 | **XZCPA1865L5** | 0.210 |
| | | 10 | **XZCPA1865L10** | 0.410 |
| | Elbowed | 5 | **XZCPA1965L5** | 0.250 |
| | | 10 | **XZCPA1965L10** | 0.485 |

## Accessories

| Description | For use with | Reference | Weight kg |
|---|---|---|---|
| **Stainless steel fixing brackets** | Ø 18 sensor | **XUZA118** | 0.045 |
| | Ø 30 sensor | **XSZBS30** | 0.080 |

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS218SAMAL2** becomes **XS218SAMAL5** with a 5 m long cable.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

XS range, Application
Food and beverage processing series
Cylindrical, stainless steel, non flush mountable
Two-wire AC or DC

## 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 effective 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 *(1)* | |
| **Operating temperature** | | **°C** | - 25…+ 85 | |
| **Materials** | Case | | Stainless steel 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** | **XS218SAM●●●** | **Hz** | ∼ 25 or ⎓ 1000 | |
| | **XS230SAM●●●** | **Hz** | ∼ 25 or ⎓ 300 | |
| **Delays** | First-up | **ms** | ≤ 30 | |
| | Response | **ms** | ≤ 0.5 | |
| | Recovery | **ms** | ≤ 0.5 **XS218SAM●●●**, ≤ 2 **XS230SAM●●●** | |

*(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

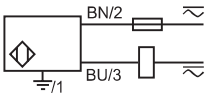
AC/DC: 2
⏚ : 1
AC/DC: 3

**Pre-cabled**

BU: Blue
BN: Brown

**2-wire ∼ or ⎓**

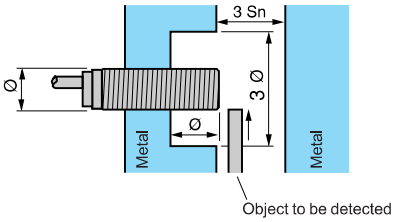
**NO output**

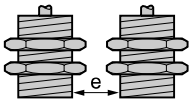


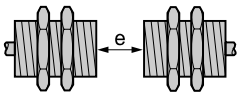

*⏚: on connector models only*

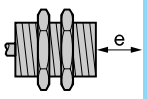
## Setting-up

**Minimum mounting distances (mm)**



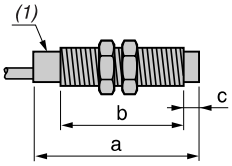




| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 18 | e ≥ 72 | e ≥ 144 | e ≥ 36 |
| Ø 30 | e ≥ 120 | e ≥ 264 | e ≥ 66 |

## Dimensions

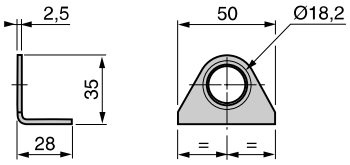
**XS2**

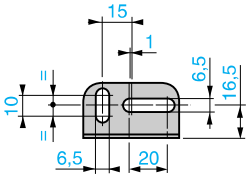



*(1) LED*

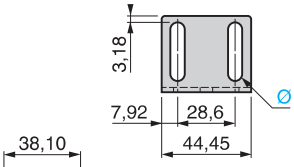
| | Pre-cabled (mm) | | Connector (mm) | | |
|---|---|---|---|---|---|
| **XS2** | **a** | **b** | **a** | **b** | **c** |
| Ø 18 | 60 | 40 | 72 | 44 | 8 |
| Ø 30 | 62.5 | 41 | 74 | 40 | 13 |

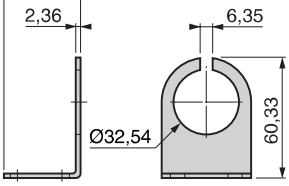
**XSZA118**




**XSZBS30**

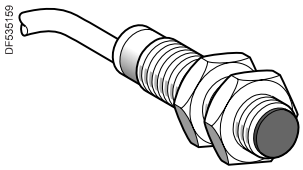


# Inductive proximity sensors

## XS range, Application, food and beverage processing series

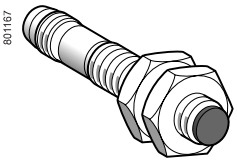
Cylindrical, plastic, non flush mountable
Three-wire DC, solid-state output




*XS2●●AA●●L2*

### Ø 12, threaded M12 x 1

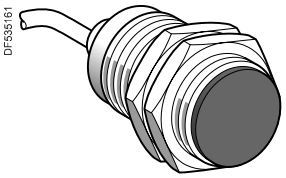
| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **7** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS212AAPAL2** | 0.065 |
| | | | M12 connector | **XS212AAPAM12** | 0.030 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS212AANAL2** | 0.065 |
| | | | M12 connector | **XS212AANAM12** | 0.030 |




*XS2●●AA●●M12*

### Ø 18, threaded M18 x 1

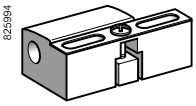
| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **12** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS218AAPAL2** | 0.100 |
| | | | M12 connector | **XS218AAPAM12** | 0.040 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS218AANAL2** | 0.100 |
| | | | M12 connector | **XS218AANAM12** | 0.040 |




*XS230AA●●L2*

### Ø 30, threaded M30 x 1.5

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **22** | NO | PNP | Pre-cabled (L = 2 m) *(1)* | **XS230AAPAL2** | 0.140 |
| | | | M12 connector | **XS230AAPAM12** | 0.080 |
| | | NPN | Pre-cabled (L = 2 m) *(1)* | **XS230AANAL2** | 0.140 |
| | | | M12 connector | **XS230AANAM12** | 0.080 |




*XSZB●●●*

### Accessories *(2)*

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 12 | **XSZB112** | 0.006 |
| | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

### Connecting cables

| Description | Type | Length m | Reference | Weight kg |
|---|---|---|---|---|
| **Pre-wired M12 connectors** Female, 4-pin, stainless steel clamping ring | Straight | 2 | **XZCPA1141L2** | 0.090 |
| | | 5 | **XZCPA1141L5** | 0.190 |
| | | 10 | **XZCPA1141L10** | 0.370 |
| | Elbowed | 2 | **XZCPA1241L2** | 0.090 |
| | | 5 | **XZCPA1241L5** | 0.190 |
| | | 10 | **XZCPA1241L10** | 0.370 |
| **M12 jumper cable** Male, 3-pin, stainless steel clamping ring | Straight | 2 | **XZCRA151140A2** | 0.090 |
| | | 5 | **XZCRA151140A5** | 0.190 |

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS212AAPAL2** becomes **XS212AAPAL5** with a 5 m long cable.*
*(2) For further information, see page 118.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

XS range, Application, food and beverage processing series

Cylindrical, plastic, non flush mountable

Three-wire DC, 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 effective 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 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** | **XS212AA●●●●** | Hz | 2500 | |
| | **XS218AA●●●●** | Hz | 1000 | |
| | **XS230AA●●●●** | Hz | 500 | |
| **Delays** | First-up | ms | ⩽ 10 | |
| | Response | ms | ⩽ 0.2 Ø 12, ⩽ 0.3 Ø 18, ⩽ 0.6 Ø 30 | |
| | Recovery | ms | ⩽ 0.2 Ø 12, ⩽ 0.7 Ø 18, ⩽ 1.4 Ø 30 | |

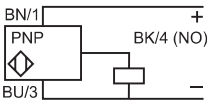
## Wiring schemes

### Connector

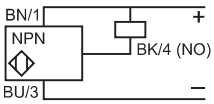
### Pre-cabled

BU: Blue
BN: Brown
BK: Black

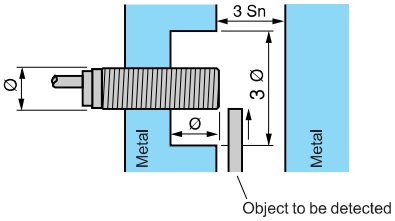
### PNP



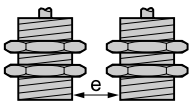

### NPN

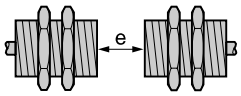


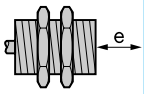

## Setting-up




### Minimum mounting distances (mm)

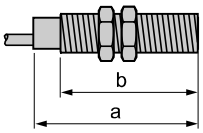



| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 12 | e ⩾ 48 | e ⩾ 84 | e ⩾ 21 |
| Ø 18 | e ⩾ 72 | e ⩾ 144 | e ⩾ 36 |
| Ø 30 | e ⩾ 120 | e ⩾ 264 | e ⩾ 66 |

## Dimensions




### XS2

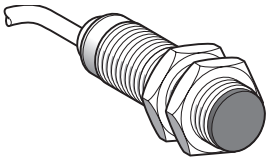
| XS2 | Pre-cabled (mm) a | Pre-cabled (mm) b | Connector (mm) a | Connector (mm) b |
|---|---|---|---|---|
| Ø 12 | 50 | 42 | 61 | 43 |
| Ø 18 | 60 | 51 | 70 | 52 |
| Ø 30 | 60 | 51 | 70 | 52 |

# Inductive proximity sensors

## XS range Application, food and beverage processing series

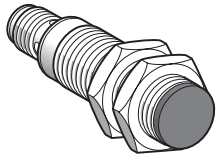
Cylindrical, plastic, non flush mountable
Two-wire AC or DC

535156



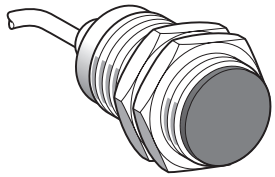
*XS2●●AAM●L2*

523382



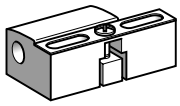
*XS2●●AAM●U20*

535158



*XS230AAM●L2*

825994



*XSZB1●●*

### Ø 18, threaded M18 x 1

| Sensing distance (Sn) mm | Function | Connection | Reference | Weight kg |
|---|---|---|---|---|
| **12** | NO | Pre-cabled (L = 2 m) *(1)* | **XS218AAMAL2** | 0.100 |
| | | 1/2"-20UNF connector | **XS218AAMAU20** | 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)* | **XS230AAMAL2** | 0.140 |
| | | 1/2"-20UNF connector | **XS230AAMAU20** | 0.080 |

### Accessories *(2)*

| Description | | Reference | Weight kg |
|---|---|---|---|
| **Fixing clamps** | Ø 18 | **XSZB118** | 0.010 |
| | Ø 30 | **XSZB130** | 0.020 |

### Connecting cables

| Description | Type | Length m | Reference | Weight kg |
|---|---|---|---|---|
| **Pre-wired connectors** 1/2"-20UNF 3-pin female, stainless steel 316 L clamping ring | Straight | 5 | **XZCPA1865L5** | 0.180 |
| | | 10 | **XZCPA1865L10** | 0.350 |
| | Elbowed | 5 | **XZCPA1965L5** | 0.180 |
| | | 10 | **XZCPA1965L10** | 0.350 |

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS218AAMAL2** becomes **XS218AAMAL5** with a 5 m long cable.*
*(2) For further information, see page 118.*

*Characteristics, schemes, setting-up, dimensions*

# Inductive proximity sensors

## XS range Application, food and beverage processing series

Cylindrical, plastic, non flush mountable
Two-wire AC or DC

## 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 effective 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** | **XS218AAM●●●** | **Hz** | ∼ 25 or ⎓ 1000 | |
| | **XS230AAM●●●** | **Hz** | ∼ 25 or ⎓ 300 | |
| **Delays** | First-up | **ms** | ⩽ 30 | |
| | Response | **ms** | ⩽ 0.5 | |
| | Recovery | **ms** | ⩽ 0.5 **XS218AAM●●●**, ⩽ 2 **XS230AAM●●●** | |

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

## Wiring schemes

**Connector**

1/2"-20UNF

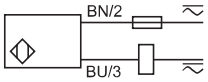
⎓: 2
⎓: 3

**Pre-cabled**

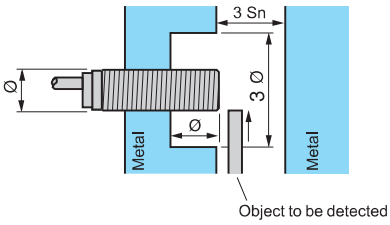
BU: Blue
BN: Brown

**2-wire ∼ or ⎓**

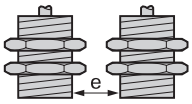
**NO output**

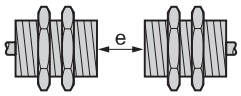


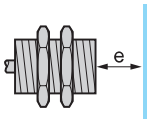

## Setting-up




**Minimum mounting distances (mm)**



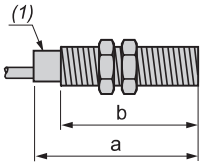




| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| Ø 18 | e ⩾ 72 | e ⩾ 144 | e ⩾ 36 |
| Ø 30 | e ⩾ 120 | e ⩾ 264 | e ⩾ 66 |

## Dimensions

**XS2**




*(1) LED*

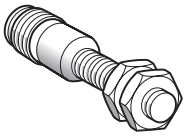
| XS2 | Pre-cabled (mm) a | Pre-cabled (mm) b | Connector (mm) a | Connector (mm) b |
|---|---|---|---|---|
| Ø 18 | 60 | 51 | 70 | 52 |
| Ø 30 | 60 | 51 | 70 | 52 |

# Inductive proximity sensors

## XS range, Application

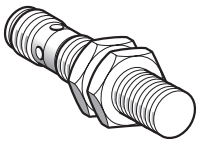
Cylindrical, stainless steel 303 front face
for harsh industrial environments
Three-wire DC, solid-state output

DF513376



*XS908●1PAM12*

DF513369



*XS912●1PAM12*

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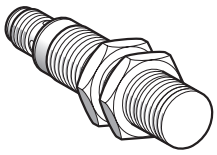
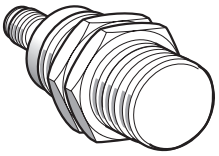


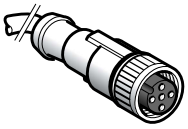
*XS918●1PAM12*

DF513380



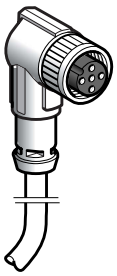
*XS930●1PAM12*

DF532604



*XZCP1141L●*

DF503630



*XZCP1241L●*

### Ø 8 mm, threaded M8 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Three-wire 12-24V ⎓, flush mountable** | | | | | |
| 3 | NO | PNP | M12 | **XS908R1PAM12** | 0.018 |
| **Three-wire 12-24V ⎓, non flush mountable** | | | | | |
| 6 | NO | PNP | M12 | **XS908R4PAM12** | 0.018 |

### Ø 12 mm, threaded M12 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Three-wire 12-24V ⎓, flush mountable** | | | | | |
| 6 | NO | PNP | M12 | **XS912R1PAM12** | 0.024 |
| **Three-wire 12-24V ⎓, non flush mountable** | | | | | |
| 10 | NO | PNP | M12 | **XS912R4PAM12** | 0.023 |

### Ø 18 mm, threaded M18 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Three-wire 12-24V ⎓, flush mountable** | | | | | |
| 10 | NO | PNP | M12 | **XS918R1PAM12** | 0.044 |
| **Three-wire 12-24V ⎓, non flush mountable** | | | | | |
| 20 | NO | PNP | M12 | **XS918R4PAM12** | 0.051 |

### Ø 30 mm, threaded M30 x 1.5

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Three-wire 12-24V ⎓, flush mountable** | | | | | |
| 20 | NO | PNP | M12 | **XS930R1PAM12** | 0.140 |
| **Three-wire 12-24V ⎓, non flush mountable** | | | | | |
| 40 | NO | PNP | M12 | **XS930R4PAM12** | 0.144 |

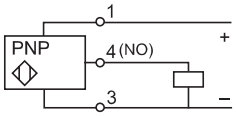
### Connecting cables (PUR) *(1)*

| Description | Type | Length m | Reference | Weight kg |
|---|---|---|---|---|
| **Pre-wired M12 connectors** Female, 4-pin Metal clamping | Straight | 2 | **XZCP1141L2** | 0.090 |
| | | 5 | **XZCP1141L5** | 0.190 |
| | | 10 | **XZCP1141L10** | 0.370 |
| | Elbowed | 2 | **XZCP1241L2** | 0.090 |
| | | 5 | **XZCP1241L5** | 0.190 |
| | | 10 | **XZCP1241L10** | 0.370 |

### Wiring schemes

**M12 connector**

**PNP**




*(1) For further information, please consult our site www.tesensors.com.*

*Characteristics, setting-up, dimensions*

# Inductive proximity sensors

## XS range, Application

Cylindrical, stainless steel 303 front face
for harsh industrial environments
Three-wire DC, solid-state output

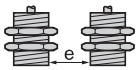
## Characteristics

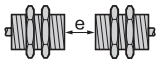
| Sensor type | Flush | | XS908R1PAM12 | XS912R1PAM12 | XS918R1PAM12 | XS930R1PAM12 |
|---|---|---|---|---|---|---|
| | Non flush | | XS908R4PAM12 | XS912R4PAM12 | XS918R4PAM12 | XS930R4PAM12 |
| **Product certifications** | | | CE, cULus | | | |
| **Connection** | Connector | | M12 | | | |
| **Operating zone** | Flush | mm | 0…2.4 | 0…4.8 | 0…8 | 0…16 |
| | Non flush | mm | 0…4.8 | 0…8 | 0…16 | 0…32 |
| **Differential travel** | | % | 1…15 (real sensing distance Sr) | | | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 67 | IP 68 (5 meters underwater for 1 month) | | |
| | Conforming to DIN 40050 | | IP 69K | | | |
| **Storage temperature** | | °C | -25…+ 70 (-13…158°F) | | | |
| **Operating temperature** | | °C | -25…+ 70 (-13…158°F) | | | |
| **Materials** | Case | | Stainless steel, 303 grade | | | |
| **Front face thickness** | | mm | 0.25 | 0.4 | 0.6 | 1.0 |
| **Mechanical shock resistance** | Conforming to IEC 62262 | | IK10 | | | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 1 mm (f = 10 to 55 Hz) | | | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 30 gn, duration 11 ms | | | |
| **Output state indication** | | | Yellow LED, 4 viewing points at 90° (blinking from 0.8 Sr and Sr) | | | |
| **Rated supply voltage** | | V | ⎓ 12…24 with protection against reverse polarity | | | |
| **Voltage limits (including ripple)** | | V | ⎓ 10…30 | | | |
| **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** | Flush | Hz | 1000 | 600 | 300 | 100 |
| | Non flush | Hz | 700 | 400 | 200 | 90 |
| **Delays** | First set-up | ms | 40 | | | |
| | Response | µs | 0.05 | 0.06 | | |
| | Recovery | µs | 23 | 15 | | |

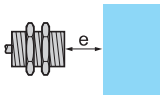
## Setting-up

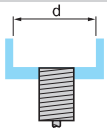
### Minimum mounting distances in mm, flush version

| | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| Ø 8 | e ≥ 14 | e ≥ 15 | e ≥ 10 | d ≥ 12 |
| Ø 12 | e ≥ 38 | e ≥ 30 | e ≥ 20 | d ≥ 24 |
| Ø 18 | e ≥ 42 | e ≥ 40 | e ≥ 30 | d ≥ 50 |
| Ø 30 | e ≥ 80 | e ≥ 70 | e ≥ 60 | d ≥ 90 |



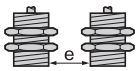



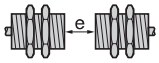



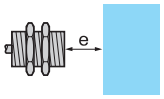



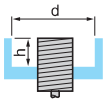

### Minimum mounting distances in mm, non flush version

| | Side by side | Face to face | Facing a metal object | Mounted in a metal support | |
|---|---|---|---|---|---|
| Ø 8 | e ≥ 52 | e ≥ 25 | e ≥ 20 | d ≥ 20 | h ≥ 15 |
| Ø 12 | e ≥ 108 | e ≥ 40 | e ≥ 30 | d ≥ 30 | h ≥ 22 |
| Ø 18 | e ≥ 182 | e ≥ 70 | e ≥ 60 | d ≥ 60 | h ≥ 34 |
| Ø 30 | e ≥ 270 | e ≥ 130 | e ≥ 120 | d ≥ 120 | h ≥ 34 |

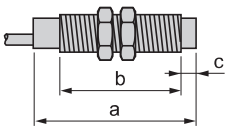



## Dimensions




Lengths (mm):
a = overall
b = threaded
c = for non flush mountable sensors

| | Flush sensor | | | | Non flush sensor | | | |
|---|---|---|---|---|---|---|---|---|
| | M8 | M12 | M18 | M30 | M8 | M12 | M18 | M30 |
| a (mm) | 66 | 60 | 63.5 | 63.5 | 66 | 60 | 63.5 | 63.5 |
| b (mm) | 46 | 41 | 42 | 42 | 42 | 36 | 35 | 32 |
| c (mm) | 0 | 0 | 0 | 0 | 4 | 5 | 7 | 10 |

## Reduction coefficient

### Non flush mounted

| | | Flush sensor | | | | Non flush sensor | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | M8 | M12 | M18 | M30 | M8 | M12 | M18 | M30 |
| Steel | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Aluminum | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brass | | 1.35 | 1.3 | 1.2 | 1.3 | 1.4 | 1.4 | 1.35 | 1.2 |
| Cupper | | 0.9 | 0.85 | 0.8 | 0.9 | 0.85 | 0.8 | 0.9 | 0.9 |
| Stainless steel | Thickness 1 mm | 0.3 | 0.5 | 0.5 | 0.35 | 0.3 | *(1)* | 0.3 | *(1)* |
| | Thickness 2 mm | 0.6 | 0.9 | 0.9 | 0.7 | 0.9 | 0.66 | 0.6 | 0.25 |

*(1) No detection.*

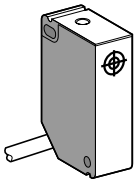
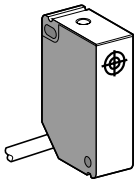
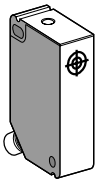
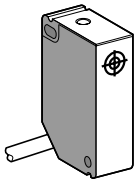
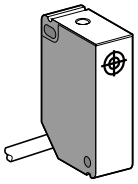
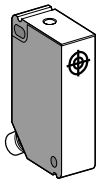
### Flush mounted

| | M8 | M12 | M18 | M30 |
|---|---|---|---|---|
| Steel | 1 | 0.7 | 0.75 | 0.9 |
| Aluminum | 0.9 | 1.15 | 0.9 | 0.7 |
| Brass | 0.9 | 1.05 | 0.75 | 0.6 |
| Stainless steel | 1 | 0.8 | 0.8 | 1.3 |

# Inductive proximity sensors

## XS range, Application

For assembly, packaging and light material 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 | **XS7G12PA140** | – | **XS7G12PA140S** | **XS8G12PA140** | – | **XS8G12PA140S** |
| | NPN NO | **XS7G12NA140** | – | **XS7G12NA140S** | **XS8G12NA140** | – | **XS8G12NA140S** |
| **4-wire ⎓** (complementary outputs) | PNP NO + NC | – | **XS7G12PC440** | – | – | **XS8G12PC440** | – |
| | NPN NO + NC | – | **XS7G12NC440** | – | – | **XS8G12NC440** | – |
| **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** | | - 40…+ 85 °C | | | | | |
| **Operating temperature** | | - 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 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 **XS7G12PA140** with 5 m long cable becomes **XS7G12PA140L1.**

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

*Dimensions, setting-up, schemes*

# Inductive proximity sensors

XS range, Application

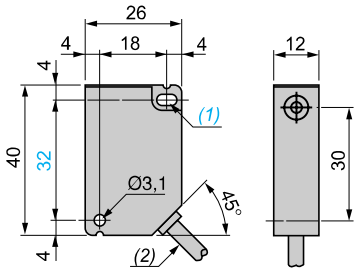
For assembly, packaging and light material handling

Plastic case, 12 x 26 x 40 mm

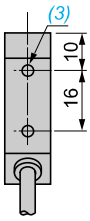
DC supply, solid-state output

## Dimensions

### XS● G12●A140, XS● G12●C440

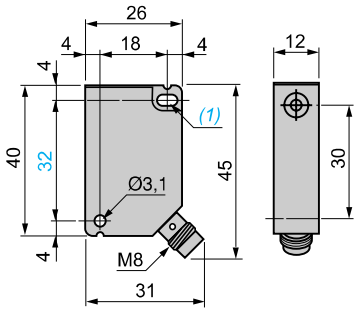



Rear view

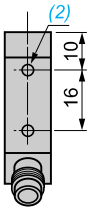



*(1) 1 elongated hole Ø 3.1 x 5.1.*
*(2) Cable L = 2 m.*
*(3) 2 holes M3 x 5.*

### XS● G12●A140S



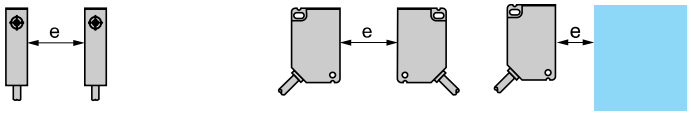

Rear view




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

## Setting-up

### Minimum mounting distances (mm)

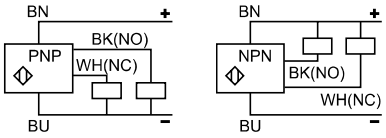



| | Side by side | Face to face | Facing a metal object and mounting in a metal support |
|---|---|---|---|
| **XS7G flush mountable** | e ⩾ 0 | e ⩾ 15 | e ⩾ 6 |
| **XS8G non flush mountable** | e ⩾ 10 | e ⩾ 60 | e ⩾ 12 |

## Wiring schemes

### 3-wire ⎓, NO output

### 4-wire ⎓, NO + NC output



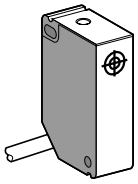
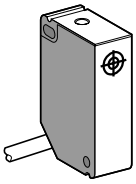

### Connector

M8

# Inductive proximity sensors

## XS range, Application

For assembly, packaging and light material handling
Plastic case, 12 x 26 x 40 mm
AC or DC supply

| Sensor | | Flush mountable in metal | Non flush mountable in metal |
|---|---|---|---|
| | |  |  |
| **Nominal sensing distance (Sn)** | | 2 mm | 4 mm |
| **References** | | | |
| **2-wire ⎓ or ∿** | NO | **XS7G12MA230** | **XS8G12MA230** |
| | NC | **XS7G12MB230** | **XS8G12MB230** |
| **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** | | - 40…+ 85 °C | |
| **Operating temperature** | | - 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 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 **XS7G12MA230** with 5 m long cable becomes **XS7G12MA230L1.**

*(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.*

*Dimensions, setting-up, schemes*

# Inductive proximity sensors

XS range, Application

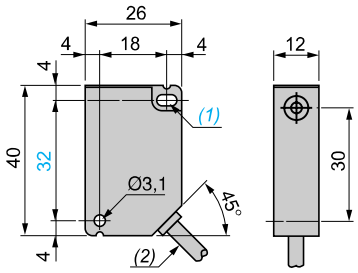
For assembly, packaging and light material handling

Plastic case, 12 x 26 x 40 mm

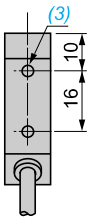
AC or DC supply

## Dimensions

**XS●G12M●230**



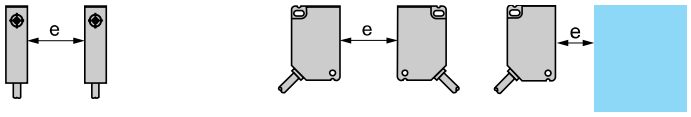

Rear view




*(1) 1 elongated hole Ø 3.1 x 5.1.*
*(2) Cable L = 2 m.*
*(3) 2 holes M3 x 5.*

## Setting-up

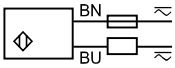
**Minimum mounting distances (mm)**




| | Side by side | Face to face | Facing a metal object and mounting in a metal support |
|---|---|---|---|
| **XS7G flush mountable** | e ⩾ 0 | e ⩾ 15 | e ⩾ 6 |
| **XS8G non flush mountable** | e ⩾ 10 | e ⩾ 60 | e ⩾ 12 |

## Wiring schemes

**2-wire ∼ or ⎓, NO or NC output**

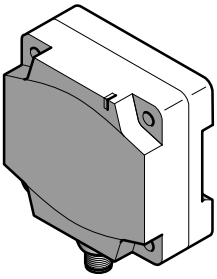


# Inductive proximity sensors

## XS range, Application

Flat sensor, flush mountable, increased range, switching capacity 300 mA
80 x 80 x 40 format, 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) |
| **Reference** | | |
| **2-wire** ⎓ (non polarised) | NO | **XS7D1A3CAM12DIN** |
| **Weight (kg)** | | 0.374 |
| **Characteristics** | | |
| **Product certifications** | | CE |
| **Degree of protection** | Conforming to IEC 60529 | IP 67, double insulation ⧈ |
| **Temperature** | Operating | - 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

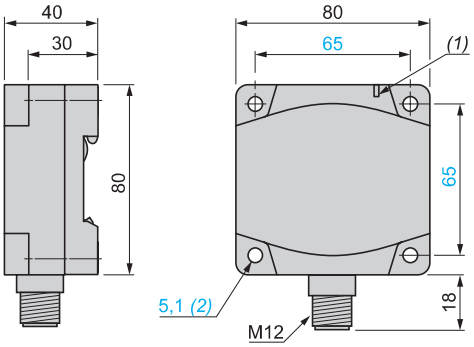
XS range, Application

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

80 x 80 x 40 format, DIN rail mounting, solid-state output

## Dimensions

**XS7D1A3CAM12DIN**

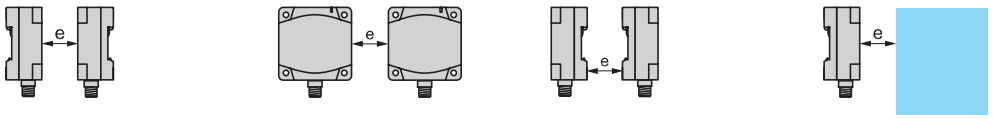



*(1) Output LED*

*(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 |

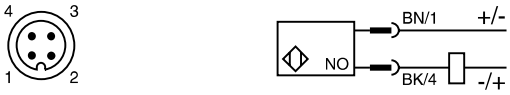
## Flush/non flush conditions

**In A37 steel**

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

## Wiring schemes

**2-wire NO/M12 XS7D1A3CAM12DIN**

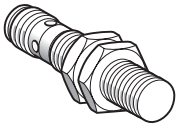


# Inductive proximity sensors

## XS range, Application

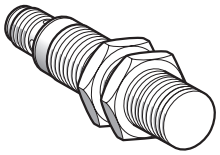
Cylindrical, stainless steel 303 front face
for welding environments
Three-wire DC, solid-state output

DF513369



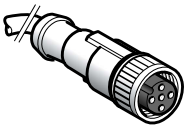
*XS912RWPAM12*

DF513373



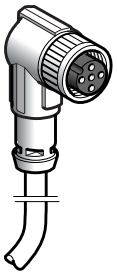
*XS918RWPAM12*

DF532604



*XZCP1141L●*

DF503630



*XZCP1241L●*

### Ø 12 mm, threaded M12 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Three-wire 12-24V ⎓, flush mountable** | | | | | |
| 6 | NO | PNP | M12 | **XS912RWPAM12** | 0.024 |

### Ø 18 mm, threaded M18 x 1

| Sensing distance (Sn) mm | Function | Output | Connection | Reference | Weight kg |
|---|---|---|---|---|---|
| **Three-wire 12-24V ⎓, flush mountable** | | | | | |
| 10 | NO | PNP | M12 | **XS918RWPAM12** | 0.051 |

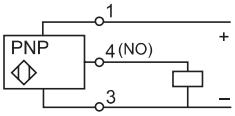
### Connecting cables (PUR) *(1)*

| Description | Type | Length m | Reference | Weight kg |
|---|---|---|---|---|
| **Pre-wired M12 connectors**<br>Female, 4-pin<br>Metal clamping ring | Straight | 2 | **XZCP1141L2** | 0.090 |
| | | 5 | **XZCP1141L5** | 0.190 |
| | | 10 | **XZCP1141L10** | 0.370 |
| | Elbowed | 2 | **XZCP1241L2** | 0.090 |
| | | 5 | **XZCP1241L5** | 0.190 |
| | | 10 | **XZCP1241L10** | 0.370 |

### Wiring schemes

**M12 connector**

**PNP**




*(1) For further information, please consult our site www.tesensors.com.*

*Characteristics, setting-up, dimensions*

# Inductive proximity sensors

XS range, Application
Cylindrical, stainless steel 303 front face
for welding environments
Three-wire DC, solid-state output

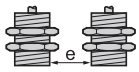
## Characteristics

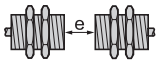
| Sensor type | Flush | | XS912RWPAM12 | XS918RWPAM12 |
|---|---|---|---|---|
| **Product certifications** | | | CE, cULus | |
| **Connection** | Connector | | M12 | |
| **Operating zone** | | mm | 0…4.8 | 0…8 |
| **Differential travel** | | % | 1…15 (real sensing distance Sr) | |
| **Degree of protection** | Conforming to IEC 60529 | | IP 68 (5 meters underwater for 1 month) | |
| | Conforming to DIN 40050 | | IP 69K | |
| **Storage temperature** | | °C | -25…+ 70 (-13…158°F) | |
| **Operating temperature** | | °C | -25…+ 70 (-13…158°F) | |
| **Materials** | Case | | Stainless steel, 303 grade | |
| **Front face thickness** | | mm | 0.4 | 0.6 |
| **Mechanical shock resistance** | Conforming to IEC 62262 | | IK10 | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | | 25 gn, amplitude ± 1 mm (f = 10 to 55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | | 30 gn, duration 11 ms | |
| **Output state indication** | | | Yellow LED, 4 viewing points at 90° (blinking from 0.8 Sr and Sr) | |
| **Rated supply voltage** | | V | ⎓ 12…24 with protection against reverse polarity | |
| **Voltage limits (including ripple)** | | V | ⎓ 10…30 | |
| **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** | | Hz | 15 | |
| **Delays** | First set-up | ms | 80 | |
| | Response | µs | 100 | |
| | Recovery | µs | 15 | |

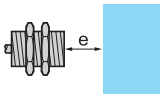
## Setting-up

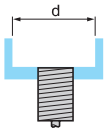
**Minimum mounting distances in mm, flush version**

| Side by side | | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| Ø 12 | e ≥ 38 | e ≥ 30 | e ≥ 20 | d ≥ 24 |
| Ø 18 | e ≥ 42 | e ≥ 40 | e ≥ 30 | d ≥ 50 |

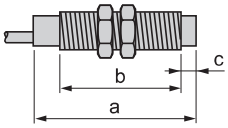



## Dimensions




Lengths (mm):
a = overall
b = threaded
c = for non flush mountable sensors

| | Flush sensor | |
|---|---|---|
| | M12 | M18 |
| a (mm) | 60 | 63.5 |
| b (mm) | 41 | 42 |
| c (mm) | 0 | 0 |

## Reduction coefficient

**Non flush mounted**

| | | Flush sensor | |
|---|---|---|---|
| | | M12 | M18 |
| Steel | | 1 | 1 |
| Aluminum | | 1 | 1 |
| Brass | | 1.3 | 1.2 |
| Cupper | | 0.85 | 0.8 |
| Stainless steel | Thickness 1 mm | 0.5 | 0.5 |
| | Thickness 2 mm | 0.9 | 0.9 |

**Flush mounted**

| | M12 | M18 |
|---|---|---|
| Steel | 0.7 | 0.75 |
| Aluminum | 1.15 | 0.9 |
| Brass | 1.05 | 0.75 |
| Stainless steel | 0.8 | 0.8 |

*References, characteristics, dimensions, schemes*

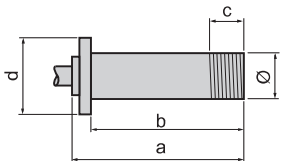
# Inductive proximity sensors

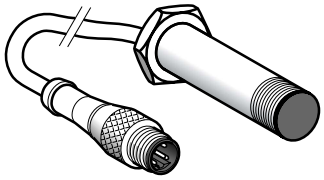
## XS range, Application

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 = Shoulder

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

| | |
|---|---|
| **Nominal sensing distance (Sn)** | **3 mm** |

## References

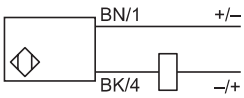
| | | | |
|---|---|---|---|
| **2-wire ⎓ (non polarised) Terminal connections** | 1-4 | NO | **XSLC1401393L3** |
| **Weight (kg)** | | | 0.065 |

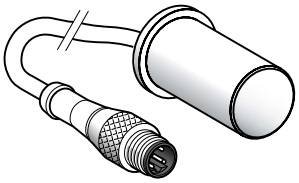
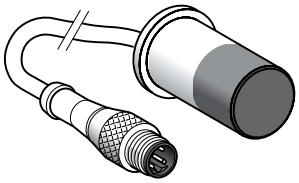
## Characteristics

| | |
|---|---|
| **Connection** | Remote M12 connector on 0.8 m flying lead |
| **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** | Yellow LED, 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: ≤ 05 ms; recovery: ≤ 0.5 ms |

## Wiring schemes

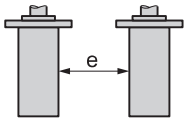
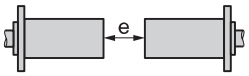
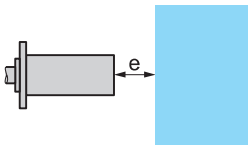
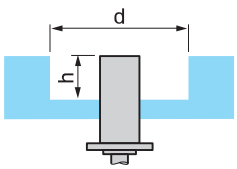
**2-wire ⎓ , non polarised, NO output**



| 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** |
| | | |
| **XSLC1401392L1** | **XSLC1401405L3** | **XSLC1401405L4** |
| 0.100 | 0.065 | 0.050 |
| | | |
| Remote M12 connector on 1.2 m flying lead | Remote M12 connector on 0.8 m flying lead | Remote M12 connector on 0.15 m flying lead |
| IP 67 | | |
| 0…5 mm | 0…8 mm | |
| 3 % of Sr | | |
| 1…15 % of Sr | | |
| - 25…+ 70 °C | | |
| Yellow LED, 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)

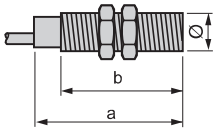
| | | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|---|
| | |  |  |  |  |
| **XSLC** | **Ø 12 (flush mountable)** | e ⩾ 10 | e ⩾ 60 | e ⩾ 15 | d = 12, h = 0 |
| | **Ø 18 (non flush mountable)** | e ⩾ 16 | e ⩾ 96 | e ⩾ 24 | d = 54, h = 16 |

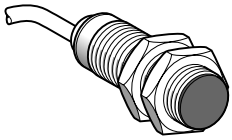
# Inductive proximity sensors

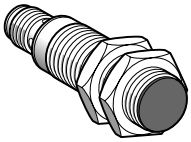
## XS range

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

### 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 | **XS1M18KPM40** | **XS1M18KPM40D** |
| **Weight (kg)** | | 0.120 | 0.060 |

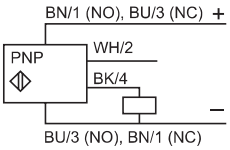
## Characteristics

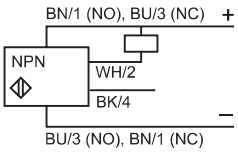
| | | | |
|---|---|---|---|
| **Product certifications** | | CE, UL, CSA | |
| **Connection** | | **Pre-cabled, PvR 4 x 0.34 mm², length 2 m** *(2)* | **M12 connector** |
| **Degree of protection** | Conforming to IEC 60529 | IP 68 | IP 67 |
| **Operating zone** | | **0…4 mm** | |
| **Repeat accuracy** | | 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, NO or NC output** | |
|---|---|---|---|
| | | **PNP** | **NPN** |

BN: brown
BU: blue
BK: black
WH: white



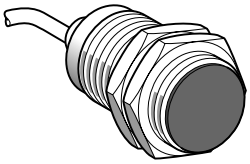




*(1) The variation in sensing distance between ferrous and non ferrous materials is typically less than 5 %.*
*(2) Sensors available with other cable lengths: please consult our Customer Care Centre.*

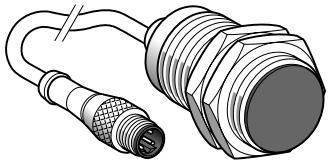
# Inductive proximity sensors

## XS range

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 = 60
b = 51.5
Ø = M30 x 1.5

| | |
|---|---|
| **Stainless steel case** | **Stainless steel case** |
| **10 mm** | **10 mm** |

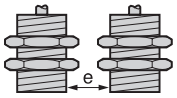
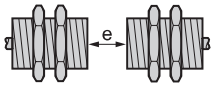
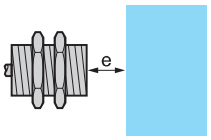
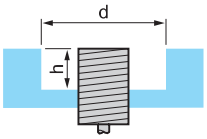
## References

| | |
|---|---|
| **XS1M30KPM40** | **XS1M30KPM40LD** |
| 0.205 | 0.145 |

## Characteristics

| | |
|---|---|
| CE, 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 |
|---|---|---|---|---|
| |  |  |  |  |
| **XS1M18 flush mountable** | e ≥ 10 | e ≥ 60 | e ≥ 15 | d ≥ 18, h ≥ 0 |
| **XS1M30 flush mountable** | e ≥ 20 | e ≥ 120 | e ≥ 30 | d ≥ 30, h ≥ 0 |

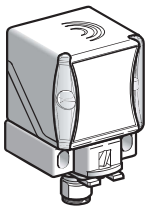
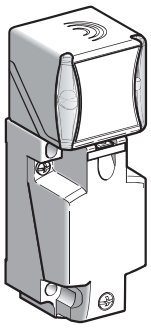
***Fixing nut tightening torque: XS1M18**: < 35 N.m, **XS1M30**: < 100 N.m*

*(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 our Customer Care Centre.*

# Inductive proximity sensors

## XS range, Application

Factor 1 sensors for ferrous or non ferrous material detection and welding applications. Plastic case, 40 x 40 mm front face. 5 position turret head

| **Sensor** | | **Flush mountable in metal** | |
|---|---|---|---|
| **Dimensions** | | **40 x 40 x 70 mm** | **40 x 40 x 117 mm** |
| | |  |  |
| **Nominal sensing distance (Sn)** | | 20 mm | |

## References

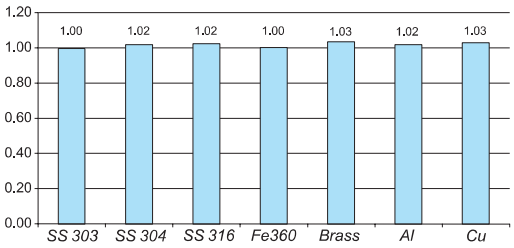
| | | | |
|---|---|---|---|
| **4-wire ⎓** | PNP NO+NC | **XS9C2A1PCM12** | **XS9C4A1PCP20** *(1)* |
| | NPN NO+NC | **XS9C2A1NCM12** | **XS9C4A1NCP20** *(1)* |
| | | **XS9C4●●●P20** sensors are available with an ISO M20 cable entry and can be supplied with a Pg 13.5 (e.g. **XS9C4A1PCG13**) or a 1/2" NPT (e.g. **XS9C4A1PCN12**) cable entry: please consult our Customer Care Centre for more information. | |
| **Weight (kg)** | | 0.110 | 0.220 |

## Characteristics

| | | | |
|---|---|---|---|
| **Product certifications** | | UL, CSA, CE | |
| **Conformity to standards** | | IEC 60947-5-2 | |
| **Connection** | | M12 connector (4-pin) | Screw terminals, clamping capacity 4 x 1.5 mm$^2$ / 4 x 16 AWG |
| **Operating zone** | | 0…16 mm | |
| **Differential travel** | | 3…15% of Sr | |
| **Repeat accuracy** | | < 3% | |
| **Immunity to magnetic fields** | | < 250 mTesla | |
| **Degree of protection** | Conforming to IEC 60529 and DIN 40050 | IP 65, IP 67 and IP 69K | |
| **Temperature** | Storage | - 40….+ 85°C | |
| | Operation *(2)* | - 25….+ 70°C | |
| **Material** | | Case: PBT | |
| **Vibration resistance** | Conforming to IEC 60068-2-6 | 25 gn, amplitude ± 2 mm (f = 10…55 Hz) | |
| **Shock resistance** | Conforming to IEC 60068-2-27 | 50 gn for 11 ms | |
| **Indicators** | | Output state: yellow LED. Supply on: green LED | |
| **Rated supply voltage** | 4-wire ⎓ | ⎓ 12…24 V with protection against reverse polarity | |
| **Voltage limits (including ripple)** | 4-wire ⎓ | ⎓ 10…36 V | |
| **Current consumption, no-load** | 4-wire ⎓ | < 30 mA | |
| **Switching capacity** | 4-wire ⎓ | < 200 mA with protection against overload and short-circuit | |
| **Voltage drop, closed state** | 4-wire ⎓ | < 2 V | |
| **Maximum switching frequency** | 4-wire ⎓ | 250 Hz | |
| **Delays** | First-up | < 15 ms | |
| | Response | < 2.5 ms | |
| | Recovery | < 2.5 ms | |

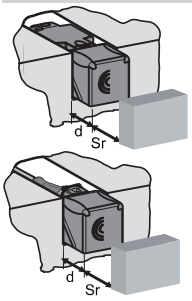
## Setting-up

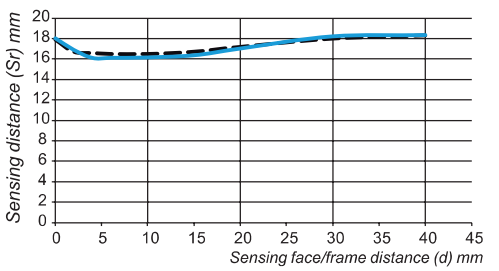
### Sensing distance correction factor




*SS: stainless steel, Fe: steel, Al: aluminium, Cu: copper.*

### Operating distance (according to the sensor's level of flush mounting)




*: Flush mounted in Fe360* *: Flush mounted in aluminium*

*(1) These sensors are supplied without a cable gland. A suitable Pg 13.5 cable gland is available (reference **XSZPE13**).*

# Inductive proximity sensors

XS range, Application

Factor 1 sensors for ferrous or non ferrous material detection and welding applications. Plastic case, 40 x 40 mm front face. 5 position turret head

## Setting-up *(continued)*

**Minimum mounting distances (mm)**

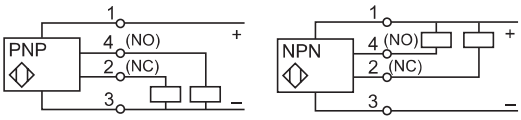
| | Side by side | Face to face | Facing a metal object |
|---|---|---|---|
| **Sensors flush mountable in metal** | e ⩾ 80 | e ⩾ 200 | e ⩾ 60 |

## Wiring schemes

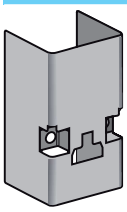
**M12 connector**

1: + V
2: NC Output
3: 0 V
4: NO Output

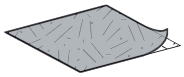
**4-wire ⎓, NO + NC outputs**




## Accessories



*XSZPSC2*

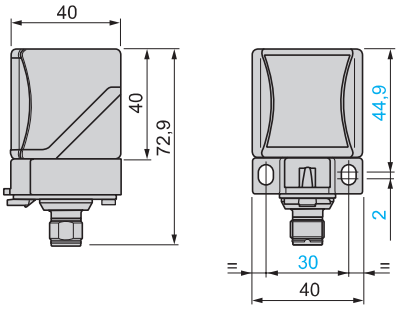


*XSZPKC2*

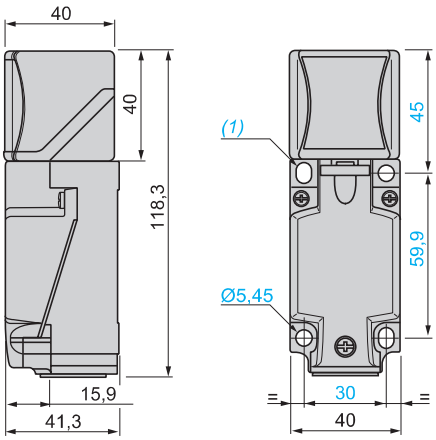
| Description | Use for | Reference | Weight kg |
|---|---|---|---|
| **Stainless steel rigid protective cover** (only suitable for use when detecting from the top) | Welding | **XSZPSC2** | 0.010 |
| **Protective sheet** (for sensing face of sensor) Sold in lots of 5 | Welding | **XSZPKC2** | 0.010 |

## Dimensions

**XS9C2A1PCM12** and **XS9C2A1NCM12**



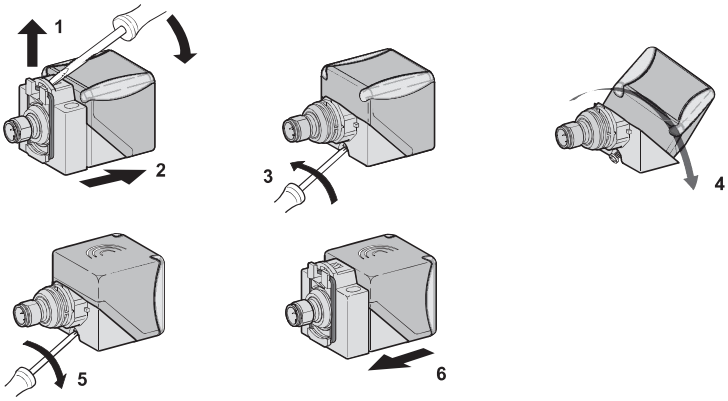

**XS9C4A1PCP20** and **XS9C4A1NCP20**



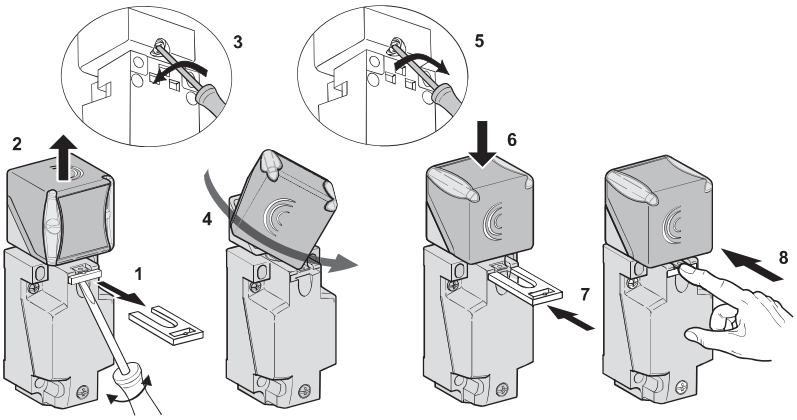

*(1) 2 elongated holes Ø 5.3 x 7 mm.*
*Tightening torque of cover fixing screws and clamp screws: < 1.2 N.m / < 10.62 lb-in.*

## Head positions

**XS9C2A1PCM12** and **XS9C2A1NCM12**




**XS9C4A1PCP20** and **XS9C4A1NCP20**

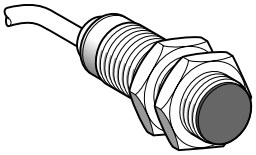


# Inductive proximity sensors

XS range, 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 | **XS1M18PAS40** |
| **3-wire, non ferrous version**<br>Insensitive to ferrous materials | PNP | NO | **XS1M18PAS20** |
| **Weight (kg)** | | | 0.120 |

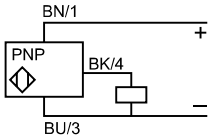
## Characteristics

| | | |
|---|---|---|
| **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** | | - 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 with other cable lengths: please consult our Customer Care Centre.*

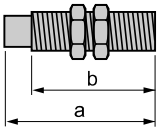
## Wiring schemes

**3-wire ⎓ PNP**




## Dimensions

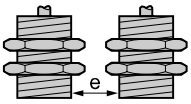
**XS1M**

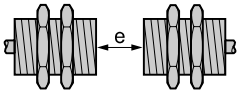


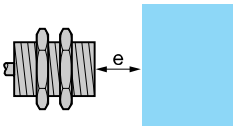

| a (mm) | b (mm) |
|---|---|
| 60 | 51.5 |

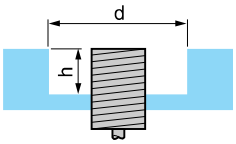
## Setting-up

**Minimum mounting distances (mm)**



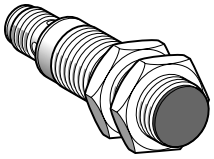

| | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| **XS1M18** | e ≥ 10 | e ≥ 60 | e ≥ 15 | d ≥ 18, h ≥ 0 (ferrous metal)<br>d ≥ 18, h ≥ 5 (non ferrous metal) |

# Inductive proximity sensors

XS range, 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 | **XS1M18PAS40D** |
| **3-wire, non ferrous version**<br>Insensitive to ferrous materials | PNP | NO | **XS1M18PAS20D** |
| **Weight (kg)** | | | 0.060 |

## Characteristics

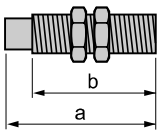
| | | |
|---|---|---|
| **Product certifications** | | UL, CSA, CE |
| **Connection** | | M12 connector |
| **Degree of protection** conforming to IEC 60529 | | IP 67 |
| **Operating zone** | | **0…4 mm** |
| **Operating temperature** | | - 25…+ 70 °C |
| **Output state indication** | | Yellow LED, 4 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 schemes

**M12 connector** | **3-wire ⎓ PNP**

## Dimensions

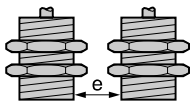
**XS1M**

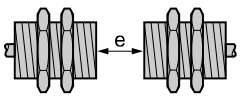


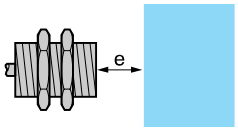

| a (mm) | b (mm) |
|---|---|
| 70 | 51.5 |

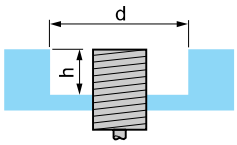
## Setting-up

**Minimum mounting distances (mm)**



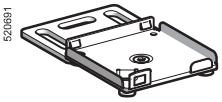




| | Side by side | Face to face | Facing a metal object | Mounted in a metal support |
|---|---|---|---|---|
| **XS1M18** | e ≥ 10 | e ≥ 60 | e ≥ 15 | d ≥ 18, h ≥ 0 (ferrous metal)<br>d ≥ 18, h ≥ 5 (non ferrous metal) |

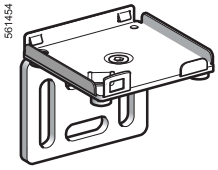
# Inductive proximity sensors

## XS range

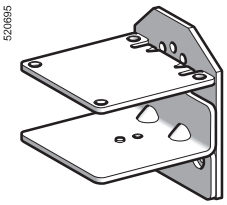
### Accessories



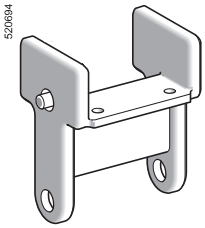

XSZB●00



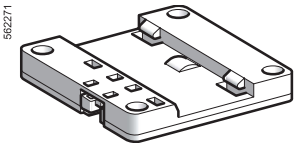

XSZB●90



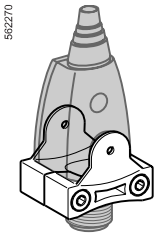

XSZBC10



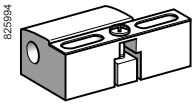

XSZBE10



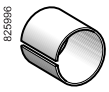

XSZBD10




XSZBPM12

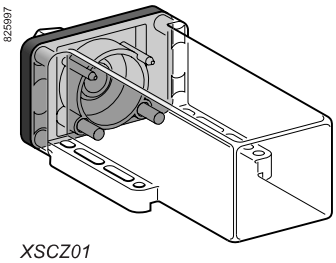



XSZB1●●



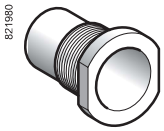

XSZA0●●

XSZP1●●




XSCZ01

XSZF10




XTAZ30

## Mounting and fixing accessories

| Description | For use with sensor | | Unit reference | Weight kg |
|---|---|---|---|---|
| | Type | Diameter (mm) | | |
| **"Clip" mounting plate** Can be mounted without "clip" on threaded holes | XS●J | – | **XSZBJ00** | 0.003 |
| | XS●F | – | **XSZBF00** | 0.005 |
| | XS●E | – | **XSZBE00** | 0.025 |
| | XS●C | – | **XSZBC00** | 0.060 |
| **"Clip" 90° mounting bracket** Can be mounted without "clip" on threaded holes | XS●J | – | **XSZBJ90** | 0.003 |
| | XS●F | – | **XSZBF90** | 0.005 |
| | XS●E | – | **XSZBE90** | 0.025 |
| | XS●C | – | **XSZBC90** | 0.060 |
| **Replacement bracket** | XS●E Replaces: XS7T2, XS8T2, XSE | – | **XSZBE10** | 0.060 |
| | XS●C Replaces: XS7T4, XS7C40, XS8T4, XS8C40 and XSC | – | **XSZBC10** | 0.110 |
| | XS●D (for XSD) *(1)* | – | **XSZBD10** | 0.065 |
| **Fixing clamp for remote control** | XS9, XS6●●●B2 | – | **XSZBPM12** | 0.015 |
| **Fixing clamps** | XS1 | 4 (plain) | **XSZB104** | 0.005 |
| | | 5 (M5 x 0.5) | **XSZB105** | 0.005 |
| | XS1, XS2 | 6.5 (plain) | **XSZB165** | 0.005 |
| | XS1, XS2, XS4, XS5, XS6 | 8 (M8 x 1) | **XSZB108** | 0.006 |
| | XS1, XS2, XS4, XS5, XS6, XT1 | 12 (M12 x 1) | **XSZB112** | 0.006 |
| | | 18 (M18 x 1) | **XSZB118** | 0.010 |
| | | 30 (M30 x 1.5) | **XSZB130** | 0.020 |
| | XT1 | 32 (plain) | **XUZB32** | 0.050 |
| **Set of 2 metal fixing nuts, nickel plated** | XS1 | 5 (M5 x 0.5) | **XSZE105** | 0.010 |
| | XS1, XS2, XS5, XS6 | 8 (M8 x 1) | **XSZE108** | 0.015 |
| | XS1, XS2, XT1, XS5, XS6 | 12 (M12 x 1) | **XSZE112** | 0.015 |
| | | 18 (M18 x 1) | **XSZE118** | 0.020 |
| | | 30 (M30 x 1.5) | **XSZE130** | 0.050 |
| **Set of 2 stainless steel fixing nuts** | XS1, XS2, XS5, XS6 | 8 (M8 x 1) | **XSZE308** | 0.015 |
| | XS1, XS2, XT1, XS5, XS6 | 12 (M12 x 1) | **XSZE312** | 0.015 |
| | | 18 (M18 x 1) | **XSZE318** | 0.020 |
| | | 30 (M30 x 1.5) | **XSZE330** | 0.050 |
| **Set of 2 plastic fixing nuts** | XS4 | 8 (M8 x 1) | **XSZE208** | 0.002 |
| | | 12 (M12 x 1) | **XSZE212** | 0.003 |
| | XS4 | 18 (M18 x 1) | **XSZE218** | 0.004 |
| | | 30 (M30 x 1.5) | **XSZE230** | 0.005 |
| **Adaptor collar Ø 20** | XS●, XT● | 18 (M18 x 1) | **XSZA020** | 0.005 |
| **Adaptor collar Ø 34** | XS●, XT● | 30 (M30 x 1.5) | **XSZA034** | 0.005 |

## Protection accessories

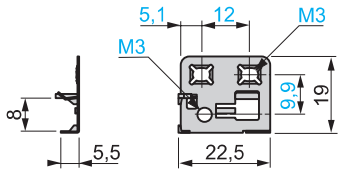
| | | | | |
|---|---|---|---|---|
| **Cable sleeve adaptor** (CNOMO type) | XS●, XT● | 12 (M12 x 1) | **XSZP112** | 0.005 |
| | | 18 (M18 x 1) | **XSZP118** | 0.005 |
| | | 30 (M30 x 1.5) | **XSZP130** | 0.010 |
| **Outer cover (IP 68)** | XT7, XS7, XS8 and XS9 (C format) | – | **XSCZ01** | 0.100 |
| **Thread adaptor** | XS●, XT● | 30 (M30 x 1.5) | **XTAZ30** | 0.035 |
| **13P cable gland** | Clamping capacity Ø 9 to 12 mm | | **XSZPE13** | 0.010 |
| **Protective cover** Sold in lots of 50 | M12 universal connectors | | **XSZF10** | 0.020 |

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

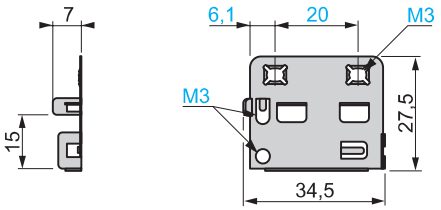
| Description | Type | Sold in lots of | Unit reference | Weight kg |
|---|---|---|---|---|
| **Cartridge fuses 5 x 20** | 0.4 A "quick-blow" | 10 | **XUZE04** | 0.001 |
| | 0.63 A "quick-blow" | 10 | **XUZE06** | 0.001 |
| | 0.8 A "quick-blow" | 10 | **XUZE08** | 0.001 |
| **Fuse terminal block for XUZE0●** | | 50 | **AB1FU10135U** | 0.040 |

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

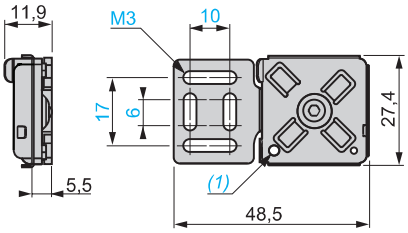
## XSZBJ00




## XSZBF00

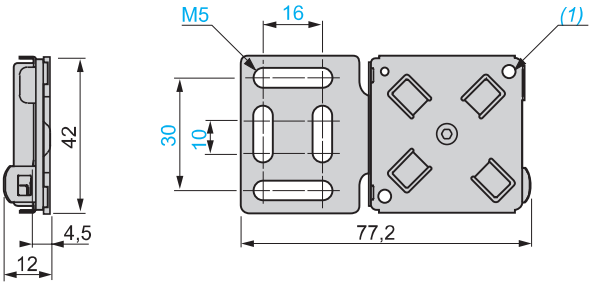



## XSZBE00



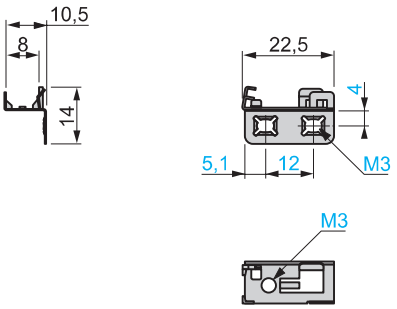

*(1) 2 screws M3 x 12 (included).*

## XSZBC00

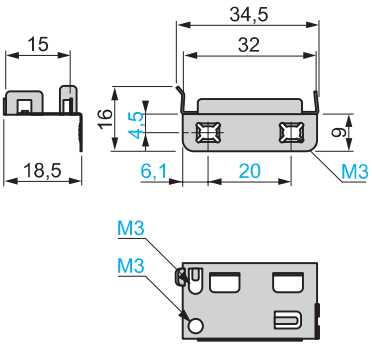



*(1) 4 screws M4 x 14 (included).*

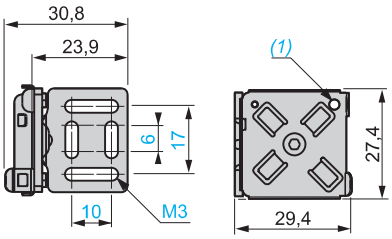
## XSZBJ90




## XSZBF90

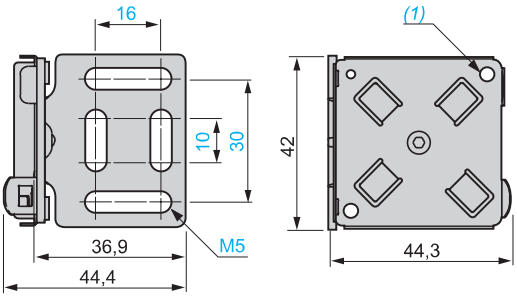



## XSZBE90



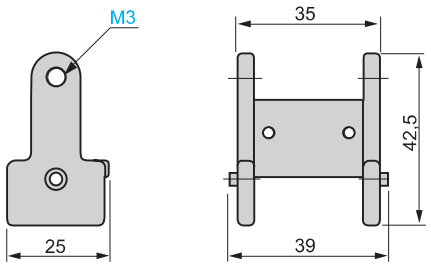

*(1) 2 screws M3 x 12 (included).*

## XSZBC90

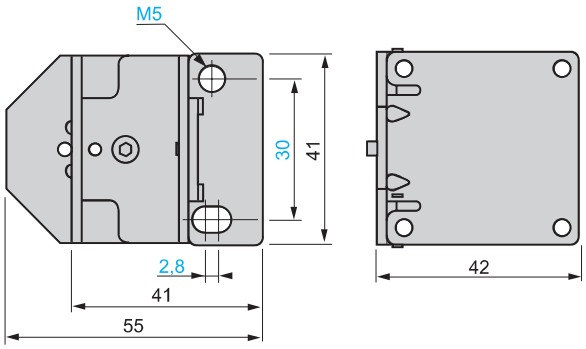



*(1) 4 screws M4 x 14 (included).*

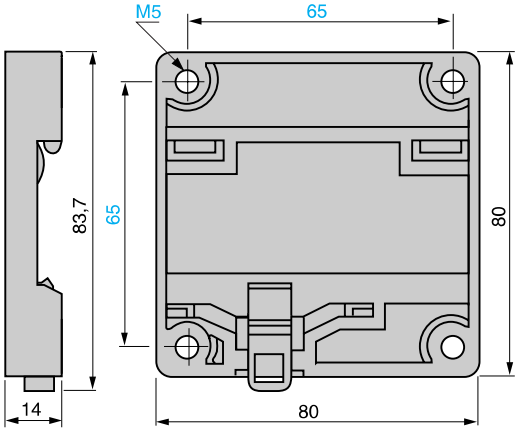
## XSZBE10



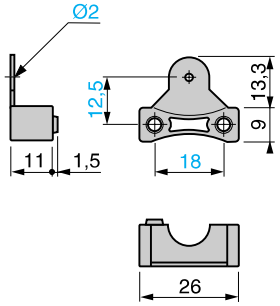

## XSZBC10



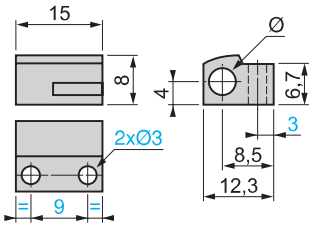

## XSZBD10 (for mounting on XS●D●●●●)




## XSZBPM12



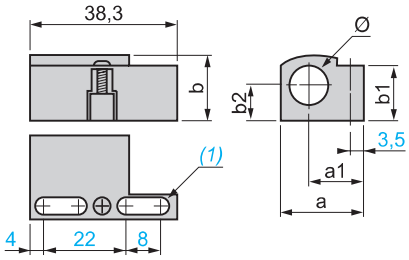

## XSZB104, XSZB105




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

***Note:*** *for fixing clamps XSZB118 and XSZB130, see mounting precautions, page 19.*

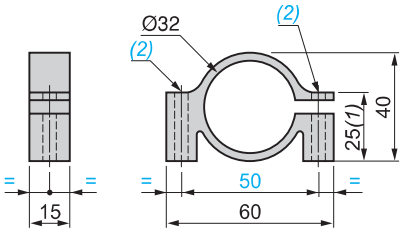
## XSZB108, XSZB112, XSZB118, XSZB130, XSZB165




| 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 |

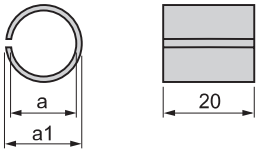
*(1) 2 elongated holes 4 x 8 mm.*

## XUZB32



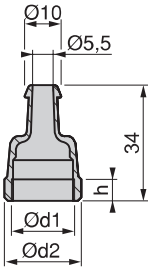

*(1) Maximum value*
*(2) 2 holes Ø 5.5*
*2 x M5 screws, HM head, included with fixing clamp*

## XSZA0●●



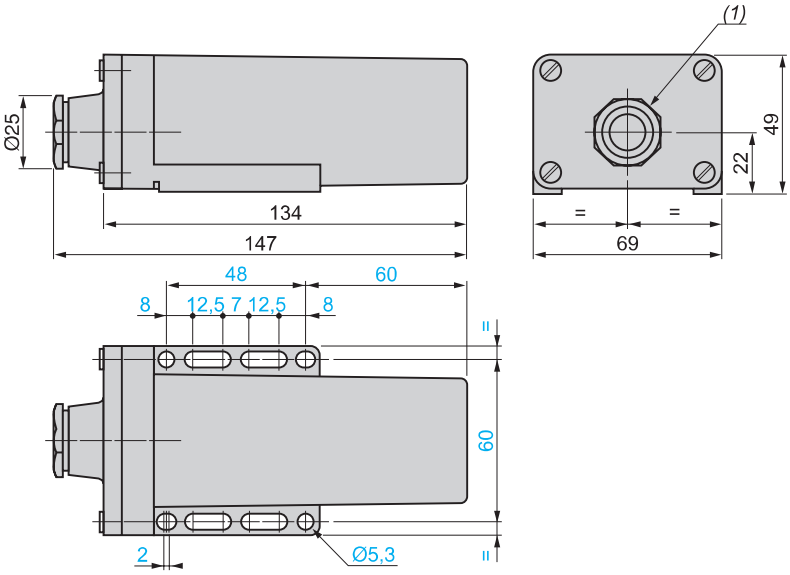

| XSZ | a | a1 |
|---|---|---|
| **A020** | Ø18 | Ø20 |
| **A034** | Ø30 | Ø34 |

## XSZP112, XSZP118, XSZP130



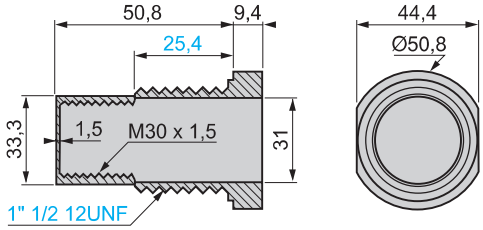

| XSZ | h | Ø d1 | Ø d2 |
|---|---|---|---|
| **P112** | 7 | 12 | 16,8 |
| **P118** | 6,2 | 18 | 23 |
| **P130** | 6,2 | 30 | 34,4 |

## XSCZ01




*(1) 13P cable gland*

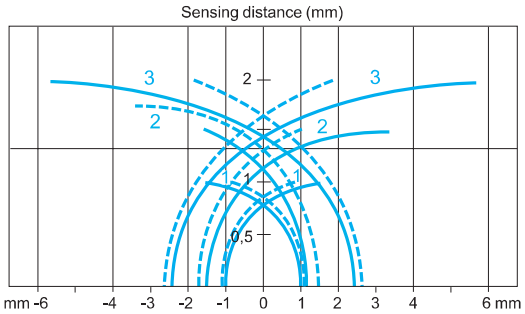
## XTAZ30



# Inductive proximity sensors
XS range

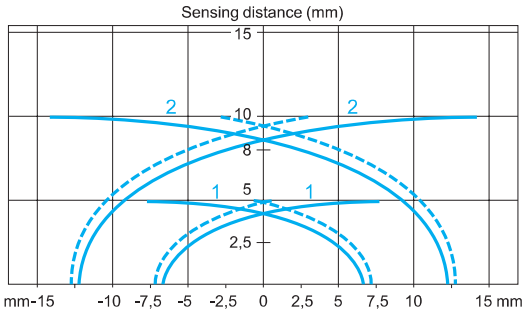
## Cylindrical type sensors

### 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 |

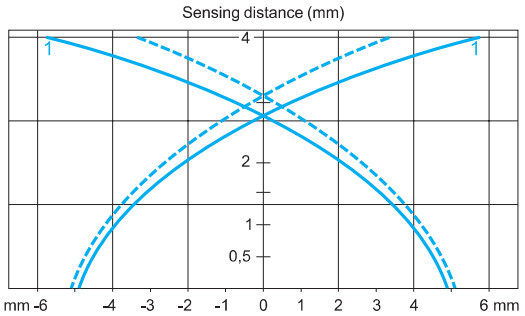
*pick-up points*
*drop-out points (object approaching from the side)*
*1 Ø 4 (plain) XS1 and Ø 5 (M5 x 0.5) XS1*
*2 Ø 6.5 (plain) XS1 and Ø 8 (M8 x 1) XS5*
*3 Ø 12 (M12 x 1) XS5*




| 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 |

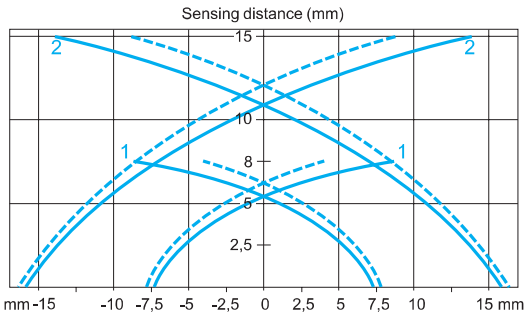
*pick-up points*
*drop-out points (object approaching from the side)*
*1 Ø 18 (M18 x 1) XS5*
*2 Ø 30 (M30 x 1.5) XS5*

### 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*

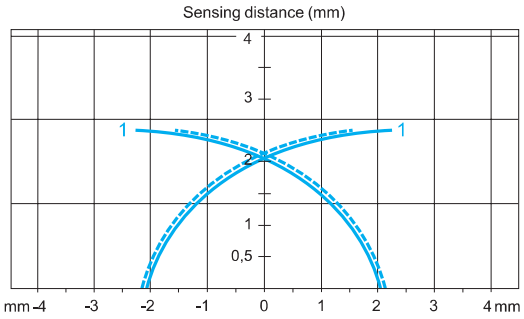



| Sensor (mm) | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **Ø 18** | 24 x 24 x 1 | 0…6.4 |
| **Ø 30** | 45 x 45 x 1 | 0…12 |

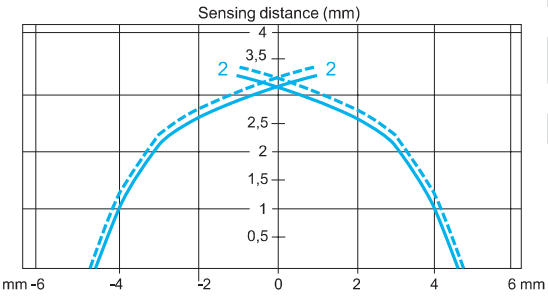
*pick-up points*
*drop-out points (object approaching from the side)*
*1 Ø 18 (M18 x 1) XS4*
*2 Ø 30 (M30 x 1.5) XS4*

## Cylindrical type sensors, increased range

### Flush mountable in metal

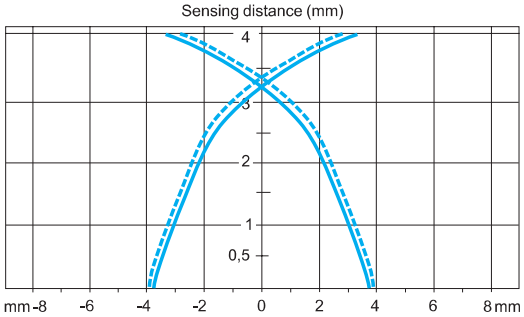


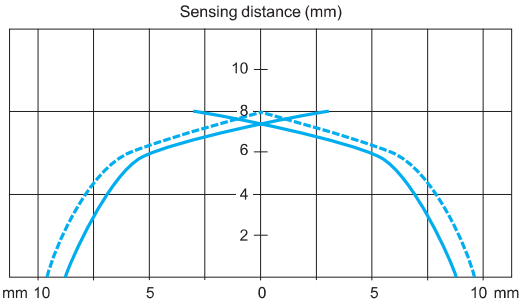

### Non flush mountable in metal



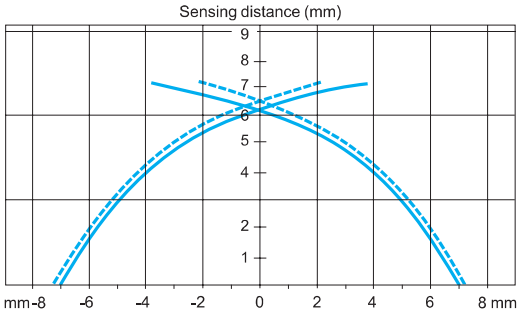

| Sensor (mm) |
|---|
| **Ø 6,5 and Ø 8** |
| **Standard steel target (mm)** |
| 8 x 8 x 1 |
| **Operating zone (mm)** |
| 0…2 (flush mounted)<br>0…3.2 (not flush mounted) |

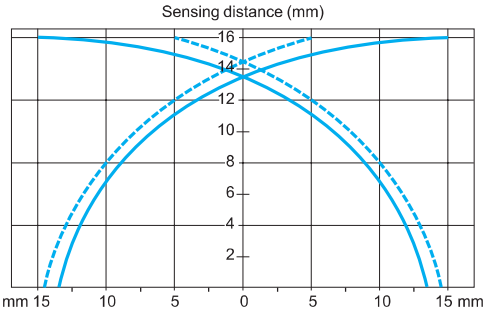
*1 Ø 6.5 (plain) XS106B3●● and Ø 8 (M8 x 1) XS108B3 and XS608B1*
*2 XS608B4*



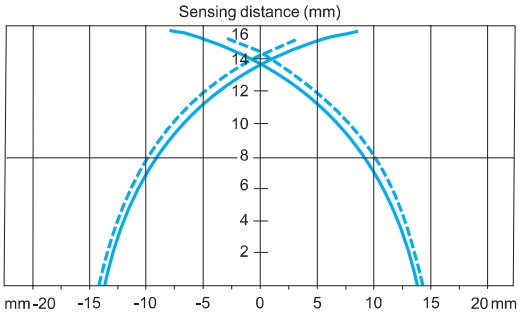



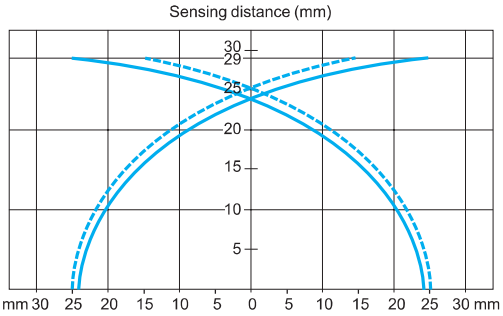

| Sensor (mm) |
|---|
| **Ø 12** |
| **Standard steel target (mm)** |
| 12 x 12 x 1 |
| **Operating zone (mm)** |
| 0…3.2 (flush mounted)<br>0…6.4 (not flush mounted) |




| Sensor (mm) |
|---|
| **Ø 18** |
| **Standard steel target (mm)** |
| 24 x 24 x1 |
| **Operating zone (mm)** |
| 0…6.4 (flush mounted)<br>0…12.8 (not flush mounted) |



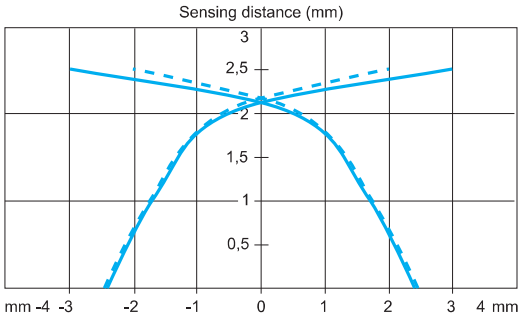




| Sensor (mm) |
|---|
| **Ø 30** |
| **Standard steel target (mm)** |
| 45 x 45 x 1 |
| **Operating zone (mm)** |
| 0…12 (flush mounted)<br>0…24 (not flush mounted) |

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

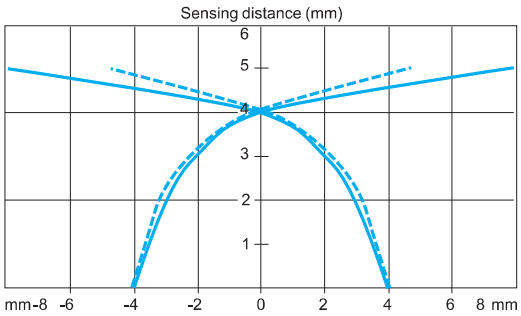
## Cubic, flat or rectangular type sensors

### Flush mountable in metal



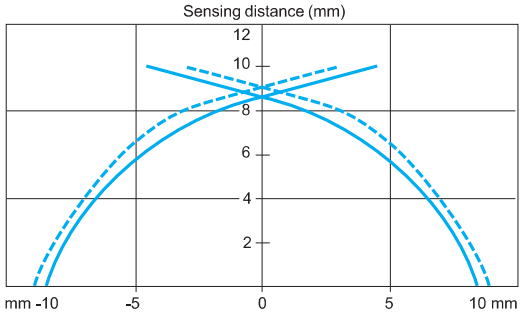

| Sensor | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **XS7J1A1** | 5 x 5 x 1 | 0...2 |

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



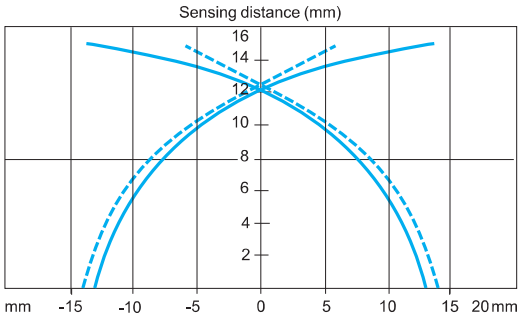

| Sensor | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **XS7F1A1** | 5 x 5 x 1 | 0...4 |

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



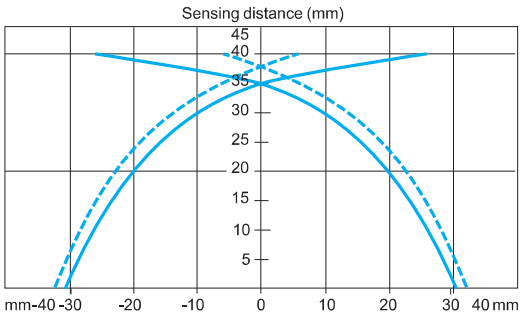

| Sensor | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **XS7E1A1** | 8 x 8 x 1 | 0...8 |

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




| Sensor | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **XS7C1A1**<br>**XS7C2A1** | 18 x 18 x 1 | 0...12 |

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

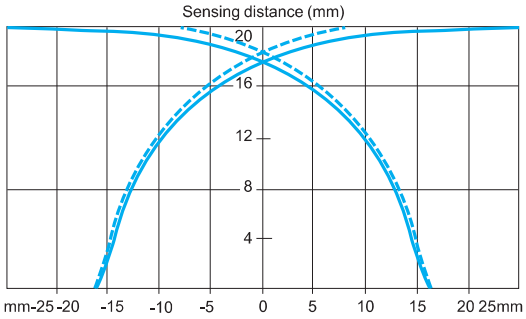



| Sensor | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **XS7D1A1** | 30 x 30 x 1 | 0...32 |

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

## Cubic or rectangular type sensors, increased range

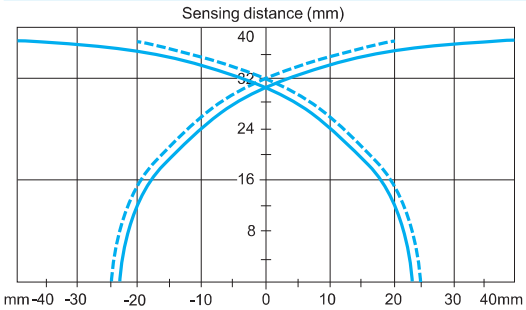
### Flush mountable in metal




| Sensor | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **XS8C●A1●●** | 30 x 30 x 1 | 0…16 |

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

### Non flush mountable in metal

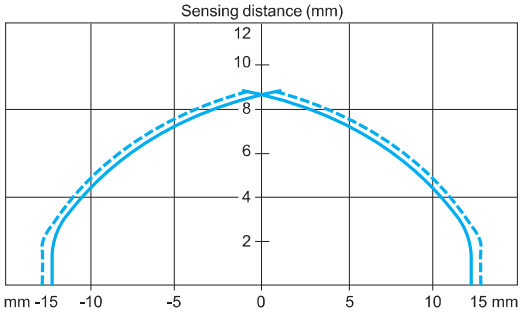


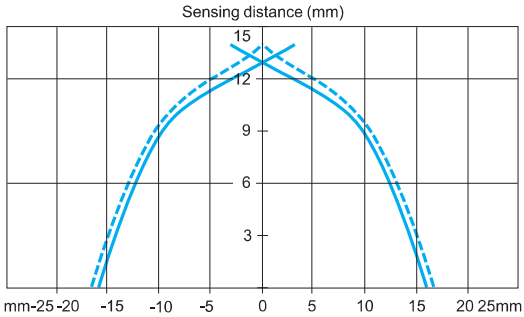

| Sensor | Standard steel target (mm) | Operating zone (mm) |
|---|---|---|
| **XS8C●A4●** | 45 x 45 x 1 | 0…32 |

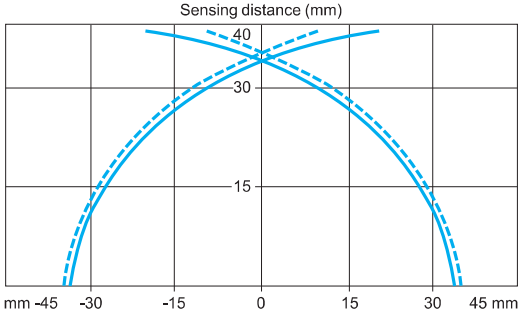
*pick-up points*
*drop-out points (object approaching from the side)*

## Flat type sensors, increased range

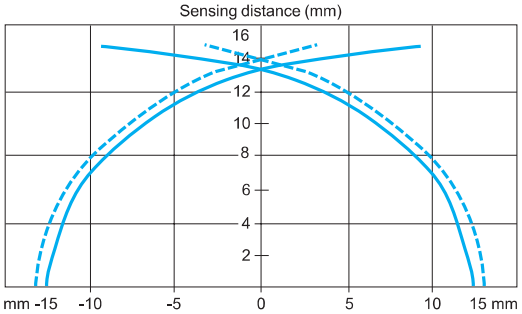
### Flush mountable in metal



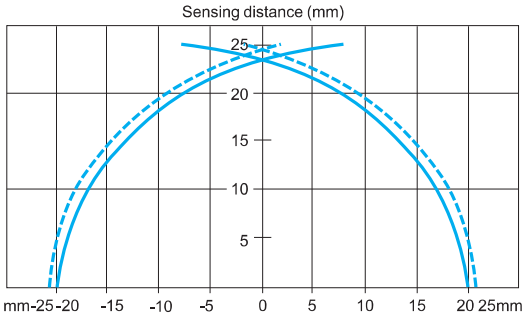



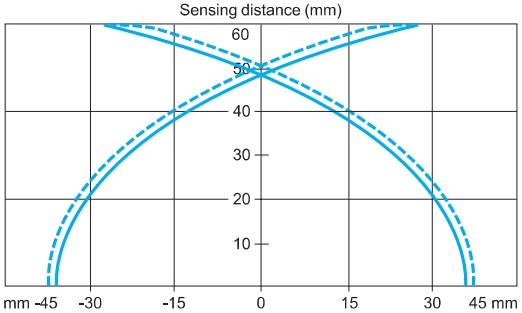

### Non flush mountable in metal




| Sensor |
|---|
| **XS8E** |
| **Standard steel target (mm)** |
| 18 x 18 x 1 |
| **Operating zone (mm)** |
| 5…10 (flush mounted)<br>5…15 (not flush mounted) |




| Sensor |
|---|
| **XS8C** |
| **Standard steel target (mm)** |
| 30 x 30 x 1 |
| **Operating zone (mm)** |
| 8…15 (flush mounted)<br>8…25 (not flush mounted) |




| Sensor |
|---|
| **XS8D** |
| **Standard steel target (mm)** |
| 45 x 45 x 1 |
| **Operating zone (mm)** |
| 20…40 (flush mounted)<br>0…60 (not flush mounted) |

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

# Substitution table

## *Sensors with the closest functionalities*

# Inductive proximity sensors

| *Old sensor* | **New XS sensor** |
|---|---|
| **Cylindrical type, DC** | |
| **Diameter 6.5 mm** | |
| ***XS1*** | |
| *XS1L06NA340* | **XS506B1NAL2** |
| *XS1L06NA340S* | **XS506B1NAM8** |
| *XS1L06NB340* | **XS506B1NBL2** |
| *XS1L06NB340S* | **XS506B1NBM8** |
| *XS1L06PA340* | **XS506B1PAL2** |
| *XS1L06PA340L1* | **XS506B1PAL5** |
| *XS1L06PA340D* | **XS506B1PAM12** |
| *XS1L06PA340S* | **XS506B1PAM8** |
| *XS1L06PB340* | **XS506B1PBL2** |
| *XS1L06PB340L1* | **XS506B1PBL5** |
| *XS1L 06PB340S* | **XS506B1PBM8** |
| *XS1L06NA349* | **XS106B3NAL2** |
| *XS1L06NA349S* | **XS106B3NAM8** |
| *XS1L06NB349* | **XS106B3NBL2** |
| *XS1L06NB349S* | **XS106B3NBM8** |
| *XS1L06PA349* | **XS106B3PAL2** |
| *XS1L06PA349L1* | **XS106B3PAL5** |
| *XS1L06PA349D* | **XS106B3PAM12** |
| *XS1L06PA349S* | **XS106B3PAM8** |
| *XS1L06PB349* | **XS106B3PBL2** |
| *XS1L06PB349L1* | **XS106B3PBL5** |
| *XS1L06PB349S* | **XS106B3PBM8** |
| **Diameter 8 mm** | |
| ***XS1*** | |
| *XS1D08NA140* | **XS108BLNAL2** |
| *XS1D08NA140D* | **XS108BLNAM12** |
| *XS1D08PA140* | **XS108BLPAL2** |
| *XS1D08PA140D* | **XS108BLPAM12** |
| *XS1D08PA140L1* | **XS108BLPAL5** |
| *XS1M08DA210* | **XS508B1DAL2** |
| *XS1M08DA210D* | **XS508B1DAM12** |
| *XS1M08DA210L1* | **XS508B1DAL5** |
| *XS1M08DA210L2* | **XS508B1DAL10** |
| *XS1M08DA210LD* | **XS508B1DAL08M12** |
| *XS1M08DB210* | **XS508B1DBL2** |
| *XS1M08DB210D* | **XS508B1DBM12** |
| *XS1M08DB210L1* | **XS508B1DBL5** |
| *XS1M08DB210LD* | **XS508B1DBM12** *(1)* |
| *XS1M08DA214D* | **XS508B1CAM12** |
| *XS1M08DA214LD* | **XS508B1CAL08M12** |

| *Old sensor* | **New XS sensor** |
|---|---|
| *XS1M08NA370* | **XS508BLNAL2** |
| *XS1M08NA370D* | **XS508BLNAM12** |
| *XS1M08NA370L1* | **XS508BLNAL5** |
| *XS1M08NB370* | **XS508BLNBL2** |
| *XS1M08NB370D* | **XS508BLNBM12** |
| *XS1M08PA370* | **XS508BLPAL2** |
| *XS1M08PA370D* | **XS508BLPAM12** |
| *XS1M08PA370L1* | **XS508BLPAL5** |
| *XS1M08PA370L2* | **XS508BLPAL10** |
| *XS1M08PA370LD* | **XS508BLPAM12** *(1)* |
| *XS1M08PA370S* | **XS508BLPAM12** *(2)* |
| *XS1M08PB370* | **XS508BLPBL2** |
| *XS1M08PB370D* | **XS508BLPBM12** |
| *XS1M08PB370L1* | **XS508BLPBL5** |
| *XS1M08PB370L2* | **XS508BLPBL10** |
| *XS1N08NA340* | **XS508B1NAL2** |
| *XS1N08NA340D* | **XS508B1NAM12** |
| *XS1N08NA340L1* | **XS508B1NAL5** |
| *XS1N08NA340L2* | **XS508B1NAL10** |
| *XS1N08NA340S* | **XS508B1NAM8** |
| *XS1N08NB340* | **XS508B1NBL2** |
| *XS1N08NB340D* | **XS508B1NBM12** |
| *XS1N08NB340S* | **XS508B1NBM8** |
| *XS1N08PA340* | **XS508B1PAL2** |
| *XS1N08PA340D* | **XS508B1PAM12** |
| *XS1N08PA340L1* | **XS508B1PAL5** |
| *XS1N08PA340L2* | **XS508B1PAL10** |
| *XS1N08PA340LD* | **XS508B1PAM12** |
| *XS1N08PA340S* | **XS508B1PAM8** |
| *XS1N08PB340* | **XS508B1PBL2** |
| *XS1N08PB340D* | **XS508B1PBM12** |
| *XS1N08PB340L1* | **XS508B1PBL5** |
| *XS1N08PB340L2* | **XS508B1PBL10** |
| *XS1N08PB340S* | **XS508B1PBM8** |
| *XS1N08NA349* | **XS108B3NAL2** |
| *XS1N08NA349L1* | **XS108B3NAL5** |
| *XS1N08NA349D* | **XS108B3NAM12** |
| *XS1N08NA349S* | **XS108B3NAM8** |
| *XS1N08NB349* | **XS108B3NBL2** |
| *XS1N08NB349L1* | **XS108B3NBL5** |
| *XS1N08NB349D* | **XS108B3NBM12** |
| *XS1N08NB349S* | **XS108B3NBM8** |
| *XS1N08PA349* | **XS108B3PAL2** |
| *XS1N08PA349L1* | **XS108B3PAL5** |
| *XS1N08PA349D* | **XS108B3PAM12** |
| *XS1N08PA349S* | **XS108B3PAM8** |
| *XS1N08PB349* | **XS108B3PBL2** |

| *Old sensor* | **New XS sensor** |
|---|---|
| *XS1N08PB349L1* | **XS108B3PBL5** |
| *XS1N08PB349D* | **XS108B3PBM12** |
| *XS1N08PB349S* | **XS108B3PBM8** |
| ***XS2*** | |
| *XS2M08NA340* | **XS608B1NAL2** |
| *XS2N08NA340* | **XS108B3NAL2** |
| *XS2N08NA340D* | **XS108B3NAM12** |
| *XS2N08NA340L1* | **XS108B3NAL5** |
| *XS2N08NA340L2* | **XS108B3NAL10** |
| *XS2N08NA340S* | **XS108B3NAM8** |
| *XS2N08NB340* | **XS108B3NBL2** |
| *XS2N08NB340D* | **XS108B3NBM12** |
| *XS2N08NB340S* | **XS108B3NBM8** |
| *XS2N08PA340* | **XS108B3PAL2** |
| *XS2N08PA340D* | **XS108B3PAM12** |
| *XS2N08PA340L1* | **XS108B3PAL5** |
| *XS2N08PA340L2* | **XS108B3PAL10** |
| *XS2N08PA340S* | **XS108B3PAM8** |
| *XS2N08PB340* | **XS108B3PBL2** |
| *XS2N08PB340D* | **XS108B3PBM12** |
| *XS2N08PB340S* | **XS108B3PBM8** |
| ***XS3*** | |
| *XS3P08NA340* | **XS508B1NAL2** *(3)* |
| *XS3P08NA340D* | **XS508B1NAM12** *(3)* |
| *XS3P08NA340L1* | **XS508B1NAL5** *(3)* |
| *XS3P08PA340* | **XS508B1PAL2** *(3)* |
| *XS3P08PA340D* | **XS508B1PAM12** *(3)* |
| *XS3P08PA340L1* | **XS508B1PAL5** *(3)* |
| *XS3P08NA370* | **XS508BLNAL2** *(3)* |
| *XS3P08NA370L1* | **XS508BLNAL5** *(3)* |
| *XS3P08PA370* | **XS508BLPAL2** *(3)* |
| *XS3P08PA370L1* | **XS508BLPAL5** *(3)* |

*(1) For the new sensor an integral M12 connector replaces the remote 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, the metal case replaces the plastic case.*

| *Old sensor* | **New XS sensor** |
|---|---|
| **Cylindrical type, DC** *(continued)* | |
| **Diameter 12 mm** | |
| ***XS1*** | |
| *XS1M12DA210* | **XS512B1DAL2** |
| *XS1M12DA210D* | **XS512B1DAM12** |
| *XS1M12DA210L1* | **XS512B1DAL5** |
| *XS1M12DA210L2* | **XS512B1DAL10** |
| *XS1M12DA210LA* | **XS512B1DAL08U78** |
| *XS1M12DA210LD* | **XS512B1DAL08M12** |
| *XS1M12DB210* | **XS512B1DBL2** |
| *XS1M12DB210D* | **XS512B1DBM12** |
| *XS1M12DB210L1* | **XS512B1DBL5** |
| *XS1M12DB210L2* | **XS512B1DBL10** |
| *XS1M12DB210LD* | **XS512B1DBL08M12** |
| *XS1M12DA214D* | **XS512B1CAM12** |
| *XS1M12DA214LD* | **XS512B1CAL08M12** |
| *XS1M12NA370* | **XS512BLNAL2** |
| *XS1M12NA370D* | **XS512BLNAM12** |
| *XS1M12NA370L1* | **XS512BLNAL5** |
| *XS1M12NA370L2* | **XS512BLNAL10** |
| *XS1M12NA370S* | **XS612B1NAM12** *(2)* |
| *XS1M12NB370* | **XS512BLNBL2** |
| *XS1M12NB370D* | **XS512BLNBM12** |
| *XS1M12PA370* | **XS512BLPAL2** |
| *XS1M12PA370D* | **XS512BLPAM12** |
| *XS1M12PA370L1* | **XS512BLPAL5** |
| *XS1M12PA370L2* | **XS512BLPAL10** |
| *XS1M12PA370LA* | **XS612B1PAL08U78** |
| *XS1M12PA370LD* | **XS612B1PAL08M12** |
| *XS1M12PB370* | **XS512BLPBL2** |
| *XS1M12PB370D* | **XS512BLPBM12** |
| *XS1M12PB370L1* | **XS512BLPBL5** |
| *XS1M12PB370L2* | **XS512BLPBL10** |
| *XS1M12PB370LD* | **XS612B1PAM12** *(1)* |
| *XS1N12NA340* | **XS512B1NAL2** |
| *XS1N12NA340D* | **XS512B1NAM12** |
| *XS1N12NA340L1* | **XS512B1NAL5** |
| *XS1N12NA340L2* | **XS512B1NAL10** |
| *XS1N12NB340* | **XS512B1NBL2** |
| *XS1N12NB340D* | **XS512B1NBM12** |
| *XS1N12NC410L2* | **XS1N12NC410D + XZCPV1141L10** |
| *XS1N12PA340* | **XS512B1PAL2** |
| *XS1N12PA340D* | **XS512B1PAM12** |
| *XS1N12PA340L1* | **XS512B1PAL5** |
| *XS1N12PA340L2* | **XS512B1PAL10** |
| *XS1N12PA340LD* | **XS512B1PAM12** *(1)* |

| *Old sensor* | **New XS sensor** |
|---|---|
| *XS1N12PA340S* | **XS512B1PAM12** *(2)* |
| *XS1N12PB340* | **XS512B1PBL2** |
| *XS1N12PB340D* | **XS512B1PBM12** |
| *XS1N12PB340L1* | **XS512B1PBL5** |
| *XS1M12PA349D* | **XS612B1PAM12** |
| *XS1N12NA349* | **XS112B3NAL2** |
| *XS1N12NA349L1* | **XS112B3NAL5** |
| *XS1N12NA349D* | **XS112B3NAM12** |
| *XS1N12NB349* | **XS112B3NBL2** |
| *XS1N12NB349L1* | **XS112B3NBL5** |
| *XS1N12NB349D* | **XS112B3NBM12** |
| *XS1N12PA349* | **XS112B3PAL2** |
| *XS1N12PA349L1* | **XS112B3PAL5** |
| *XS1N12PA349D* | **XS112B3PAM12** |
| *XS1N12PB349* | **XS112B3PBL2** |
| *XS1N12PB349L1* | **XS112B3PBL5** |
| *XS1N12PB349D* | **XS112B3PBM12** |
| ***XS2*** | |
| *XS2M12NA370* | **XS612B1NAL2** |
| *XS2M12NA370D* | **XS612B1NAM12** |
| *XS2M12NA370L1* | **XS612B1NAL5** |
| *XS2M12NA370L2* | **XS612B1NAL10** |
| *XS2M12NB370* | **XS612B1NBL2** |
| *XS2M12NB370D* | **XS612B1NBM12** |
| *XS2M12PA370* | **XS612B1PAL2** |
| *XS2M12PA370D* | **XS612B1PAM12** |
| *XS2M12PA370L1* | **XS612B1PAL5** |
| *XS2M12PA370L2* | **XS612B1PAL10** |
| *XS2M12PA370LA* | **XS612B1PAL08U78** |
| *XS2M12PA370LD* | **XS612B1PAL08M12** |
| *XS2M12PB370* | **XS612B1PBL2** |
| *XS2M12PB370D* | **XS612B1PBM12** |
| *XS2M12PB370L1* | **XS612B1PBL5** |
| *XS2M12PB370S* | **XS612B1PBM12** *(2)* |
| *XS2N12NA340* | **XS112B3NAL2** |
| *XS2N12NA340D* | **XS112B3NAM12** |
| *XS2N12NA340L1* | **XS112B3NAL5** |
| *XS2N12NA340L2* | **XS112B3NAL10** |
| *XS2N12NB340* | **XS112B3NBL2** |
| *XS2N12NB340D* | **XS112B3NBM12** |
| *XS2N12NC410L1* | **XS2N12NC410D + XZCPV1141L5** |
| *XS2N12PA340* | **XS112B3PAL2** |
| *XS2N12PA340D* | **XS112B3PAM12** |
| *XS2N12PA340L1* | **XS112B3PAL5** |
| *XS2N12PA340L2* | **XS112B3PAL10** |
| *XS2N12PC410* | **XS112B3PCL2** |

| *Old sensor* | **New XS sensor** |
|---|---|
| *XS2N12PC410D* | **XS112B3PCM12** |
| *XS2N12PC410L1* | **XS112B3PCM12 + XZCPV1141L5** |
| *XS2N12PC410L2* | **XS112B3PCM12 + XZCPV1141L10** |
| *XS2N12PB340* | **XS112B3PBL2** |
| *XS2N12PB340D* | **XS112B3PBM12** |
| *XS2N12PB340L1* | **XS112B3PBL5** |
| ***XS3*** | |
| *XS3P12NA340* | **XS512B1NAL2** *(3)* |
| *XS3P12NA340D* | **XS512B1NAM12** *(3)* |
| *XS3P12NA340L1* | **XS512B1NAL5** *(3)* |
| *XS3P12PA340* | **XS512B1PAL2** *(3)* |
| *XS3P12PA340D* | **XS512B1PAM12** *(3)* |
| *XS3P12PA340L1* | **XS512B1PAL5** *(3)* |
| *XS3P12NA370* | **XS512BLNAL2** *(3)* |
| *XS3P12NA370L1* | **XS512BLNAL5** *(3)* |
| *XS3P12PA370* | **XS512BLPAL2** *(3)* |
| *XS3P12PA370L1* | **XS512BLPAL5** *(3)* |
| ***XS4*** | |
| *XS4P12PC410L2* | **XS4P12PC410D + XZCPV1141L10** |

*(1) For the new sensor an integral M12 connector replaces the remote 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, the metal case replaces the plastic case.*

| *Old sensor* | **New XS sensor** |
|---|---|
| **Cylindrical type, DC** *(continued)* | |
| **Diameter 18 mm** | |
| ***XS1*** | |
| *XS1M18DA210* | **XS518B1DAL2** |
| *XS1M18DA210B* | **XS518B1DAL01B** *(4)* |
| *XS1M18DA210C* | **XS518B1DAL01C** *(4)* |
| *XS1M18DA210D* | **XS518B1DAM12** |
| *XS1M18DA210G* | **XS518B1DAL01G** *(4)* |
| *XS1M18DA210L1* | **XS518B1DAL5** |
| *XS1M18DA210L2* | **XS518B1DAL10** |
| *XS1M18DA210LD* | **XS518B1DAL08M12** |
| *XS1M18DB210* | **XS518B1DBL2** |
| *XS1M18DB210B* | **XS518B1DBL01B** *(4)* |
| *XS1M18DB210D* | **XS518B1DBM12** |
| *XS1M18DB210LD* | **XS518B1DBL08M12** |
| *XS1M18DA214D* | **XS518B1CAM12** |
| *XS1M18DA214LD* | **XS518B1CAL08M12** |
| *XS1M18NA370* | **XS518BLNAL2** |
| *XS1M18NA370A* | **XS618B1NAL01U78** *(4)* |
| *XS1M18NA370B* | **XS618B1NAL01B** *(4)* |
| *XS1M18NA370C* | **XS618B1NAL01C** *(4)* |
| *XS1M18NA370D* | **XS518BLNAM12** |
| *XS1M18NA370L1* | **XS518BLNAL5** |
| *XS1M18NA370L2* | **XS518BLNAL10** |
| *XS1M18NB370* | **XS518BLNBL2** |
| *XS1M18NB370B* | **XS618B1NBL01B** *(4)* |
| *XS1M18NB370C* | **XS618B1NBL01C** *(4)* |
| *XS1M18NB370D* | **XS518BLNBM12** |
| *XS1M18NB370L1* | **XS518BLNBL5** |
| *XS1M18NB370L2* | **XS518BLNBL10** |
| *XS1M18PA370* | **XS518BLPAL2** |
| *XS1M18PA370A* | **XS618B1PAL01U78** *(4)* |
| *XS1M18PA370B* | **XS618B1PAL01B** *(4)* |
| *XS1M18PA370C* | **XS618B1PAL01C** *(4)* |
| *XS1M18PA370D* | **XS518BLPAM12** |
| *XS1M18PA370G* | **XS618B1PAL01G** *(4)* |
| *XS1M18PA370DTQ* | **XS518BLPAM12TQ** |
| *XS1M18PA370G* | **XS618B1PAL01G** *(4)* |
| *XS1M18PA370L1* | **XS518BLPAL5** |
| *XS1M18PA370L2* | **XS518BLPAL10** |
| *XS1M18PA370LA* | **XS618B1PAL08U78** |
| *XS1M18PA370LD* | **XS518BLPAM12** *(1)* |
| *XS1M18PA370DTQ* | **XS518BLPAM12TQ** |
| *XS1M18PA370TF* | **XS518BLPAL2TF** |
| *XS1M18PB370* | **XS518BLPBL2** |
| *XS1M18PB370A* | **XS618B1PBL01U78** *(4)* |
| *XS1M18PB370B* | **XS618B1PBL01B** *(4)* |

| *Old sensor* | **New XS sensor** |
|---|---|
| ***XS1*** | |
| *XS1M18PB370D* | **XS518BLPBM12** |
| *XS1M18PB370L1* | **XS518BLPBL5** |
| *XS1M18PB370L2* | **XS518BLPBL10** |
| *XS1M18PB370C* | **XS618B1PBL01C** *(4)* |
| *XS1N18NA340* | **XS518B1NAL2** |
| *XS1N18NA340D* | **XS518B1NAM12** |
| *XS1N18NA340L1* | **XS518B1NAL5** |
| *XS1N18NA340L2* | **XS518B1NAL10** |
| *XS1N18NB340* | **XS518B1NBL2** |
| *XS1N18NB340D* | **XS518B1NBM12** |
| *XS1N18NB340L2* | **XS518B1NBL10** |
| *XS1N18NC410L1* | **XS1N18NC410D + XZCPV1141L5** |
| *XS1N18PA340* | **XS518B1PAL2** |
| *XS1N18PA340D* | **XS518B1PAM12** |
| *XS1N18PA340L1* | **XS518B1PAL5** |
| *XS1N18PA340L2* | **XS518B1PAL10** |
| *XS1N18PB340* | **XS518B1PBL2** |
| *XS1N18PB340D* | **XS518B1PBM12** |
| *XS1N18PB340L2* | **XS518B1PBL10** |
| ***XS2*** | |
| *XS2N18NA340* | **XS118B3NAL2** |
| *XS2N18NA340D* | **XS118B3NAM12** |
| *XS2N18NA340L1* | **XS118B3NAL5** |
| *XS2N18NA340L2* | **XS118B3NAL10** |
| *XS2N18NB340* | **XS118B3NBL2** |
| *XS2N18NC410L2* | **XS2N18NC410D + XZCPV1141L10** |
| *XS2N18PC410* | **XS118B3PCL2** |
| *XS2N18PC410D* | **XS118B3PCM12** |
| *XS2N18PC410L1* | **XS118B3PCM12 + XZCPV1141L5** |
| *XS2N18NB340D* | **XS118B3NBM12** |
| *XS2N18PA340* | **XS118B3PAL2** |
| *XS2N18PA340D* | **XS118B3PAM12** |
| *XS2N18PA340L1* | **XS118B3PAL5** |
| *XS2N18PA340L2* | **XS118B3PAL10** |
| *XS2N18PB340* | **XS118B3PBL2** |
| *XS2N18PB340D* | **XS118B3PBM12** |
| *XS2M18NA370* | **XS618B1NAL2** |
| *XS2M18NA370A* | **XS618B1NAL01U78** *(4)* |
| *XS2M18NA370B* | **XS618B1NAL01B** *(4)* |
| *XS2M18NA370C* | **XS618B1NAL01C** *(4)* |
| *XS2M18NA370D* | **XS618B1NAM12** |
| *XS2M18NA370L1* | **XS618B1NAL5** |
| *XS2M18NA370L2* | **XS618B1NAL10** |
| *XS2M18NB370* | **XS618B1NBL2** |

| *Old sensor* | **New XS sensor** |
|---|---|
| *XS2M18NB370B* | **XS618B1NBL01B** *(4)* |
| *XS2M18NB370C* | **XS618B1NBL01C** *(4)* |
| *XS2M18NB370D* | **XS618B1NBM12** |
| *XS2M18NB370L1* | **XS618B1NBL5** |
| *XS2M18NB370L2* | **XS618B1NBL10** |
| *XS2M18PA370* | **XS618B1PAL2** |
| *XS2M18PA370A* | **XS618B1PAL01U78** *(4)* |
| *XS2M18PA370B* | **XS618B1PAL01B** *(4)* |
| *XS2M18PA370C* | **XS618B1PAL01C** *(4)* |
| *XS2M18PA370D* | **XS618B1PAM12** |
| *XS2M18PA370G* | **XS618B1PAL01G** *(4)* |
| *XS2M18PA370LA* | **XS618B1PAL08U78** *(4)* |
| *XS2M18PA370L1* | **XS618B1PAL5** |
| *XS2M18PA370L2* | **XS618B1PAL10** |
| *XS2M18PB370* | **XS618B1PBL2** |
| *XS2M18PB370A* | **XS618B1PBL01U78** *(4)* |
| *XS2M18PB370B* | **XS618B1PBL01B** *(4)* |
| *XS2M18PB370C* | **XS618B1PBL01C** *(4)* |
| *XS2M18PB370D* | **XS618B1PBM12** |
| *XS2M18PB370L1* | **XS618B1PBL5** |
| *XS2M18PB370L2* | **XS618B1PBL10** |
| ***XS3*** | |
| *XS3P18NA340* | **XS518B1NAL2** *(3)* |
| *XS3P18NA340D* | **XS518B1NAM12** *(3)* |
| *XS3P18NA340L1* | **XS518B1NAL5** *(3)* |
| *XS3P18PA340* | **XS518B1PAL2** *(3)* |
| *XS3P18PA340D* | **XS518B1PAM12** *(3)* |
| *XS3P18PA340L1* | **XS518B1PAL5** *(3)* |
| *XS3P18NA370* | **XS518BLNAL2** *(3)* |
| *XS3P18NA370L1* | **XS518BLNAL5** *(3)* |
| *XS3P18PA370* | **XS518BLPAL2** *(3)* |
| *XS3P18PA370L1* | **XS518BLPAL5** *(3)* |
| *XS3P18PA370L2* | **XS518BLPAL10** *(3)* |
| ***XS4*** | |
| *XS4P18NA370B* | **XS4P18NA370L01B** *(4)* |
| *XS4P18NB370B* | **XS4P18NB370L01B** *(4)* |
| *XS4P18PA370B* | **XS4P18PA370L01B** *(4)* |
| *XS4P18PB370B* | **XS4P18PB370L01B** *(4)* |
| *XS4P18PC410L1* | **XS4P18PC410D + XZCPV1141L5** |

*(1) For the new sensor an integral M12 connector replaces the remote M12 connector on a 0.80 m flying lead.*
*(3) For the new sensor, the metal case replaces the plastic case.*
*(4) For the new sensor, connectors A, B, C and G on 0.1 m flying lead replace integral connectors A, B, C and G.*

| *Old sensor* | **New XS sensor** |
|---|---|
| **Cylindrical type, DC** *(continued)* | |
| **Diameter 30 mm** | |
| ***XS1*** | |
| *XS1M30DA210* | **XS530B1DAL2** |
| *XS1M30DA210B* | **XS530B1DAL01B** *(4)* |
| *XS1M30DA210C* | **XS530B1DAL01C** *(4)* |
| *XS1M30DA210D* | **XS530B1DAM12** |
| *XS1M30DA210G* | **XS530B1DAL01G** *(4)* |
| *XS1M30DA210L1* | **XS530B1DAL5** |
| *XS1M30DA210L2* | **XS530B1DAL10** |
| *XS1M30DA210LD* | **XS530B1DAL08M12** |
| *XS1M30DB210* | **XS530B1DBL2** |
| *XS1M30DB210B* | **XS530B1DBL01B** *(4)* |
| *XS1M30DB210D* | **XS530B1DBM12** |
| *XS1M30DB210LD* | **XS530B1DBM12** *(1)* |
| *XS1M30DA214D* | **XS530B1CAM12** |
| *XS1M30DA214LD* | **XS530B1CAL08M12** |
| *XS1M30PA349D* | **XS630B1PAM12** *(5)* |
| *XS1M30NA370* | **XS530BLNAL2** |
| *XS1M30NA370B* | **XS630B1NAL01B** *(4)* |
| *XS1M30NA370C* | **XS630B1NAL01C** *(4)* |
| *XS1M30NA370D* | **XS530BLNAM12** |
| *XS1M30NA370L1* | **XS530BLNAL5** |
| *XS1M30NA370L2* | **XS530BLNAL10** |
| *XS1M30NB370* | **XS530BLNBL2** |
| *XS1M30NB370B* | **XS630B1NBL01B** *(4)* |
| *XS1M30NB370C* | **XS630B1NBL01C** *(4)* |
| *XS1M30NB370D* | **XS530BLNBM12** |
| *XS1M30NB370L1* | **XS530BLNBL5** |
| *XS1M30NB370L2* | **XS530BLNBL10** |
| *XS1M30PA370* | **XS530BLPAL2** |
| *XS1M30PA370A* | **XS630B1PAL01U78** *(4)* |
| *XS1M30PA370B* | **XS630B1PAL01B** *(4)* |
| *XS1M30PA370C* | **XS630B1PAL01C** *(4)* |
| *XS1M30PA370D* | **XS530BLPAM12** |
| *XS1M30PA370G* | **XS630B1PAL01G** *(4)* |
| *XS1M30PA370L1* | **XS530BLPAL5** |
| *XS1M30PA370L2* | **XS530BLPAL10** |
| *XS1M30PB370* | **XS530BLPBL2** |
| *XS1M30PB370B* | **XS630B1PBL01B** *(4)* |
| *XS1M30PB370C* | **XS630B1PBL01C** *(4)* |
| *XS1M30PB370D* | **XS530BLPBM12** |
| *XS1M30PB370G* | **XS630B1PBL01G** *(4)* |
| *XS1M30PB370L1* | **XS530BLPBL5** |
| *XS1M30PB370L2* | **XS530BLPBL10** |

| *Old sensor* | **New XS 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** |
| ***XS2*** | |
| *XS2N30NA340* | **XS130B3NAL2** |
| *XS2N30NA340D* | **XS130B3NAM12** |
| *XS2N30NA340L1* | **XS130B3NAL5** |
| *XS2N30NA340L2* | **XS130B3NAL10** |
| *XS2N30NB340* | **XS130B3NBL2** |
| *XS2N30NC410L1* | **XS2N30NC410D + XZCPV1141L5** |
| *XS2N30PC410* | **XS130B3PCL2** |
| *XS2N30PC410D* | **XS130B3PCM12** |
| *XS2N30PC410L1* | **XS130B3PCM12 + XZCPV1141L5** |
| *XS2N30NB340D* | **XS130B3NBM12** |
| *XS2N30PA340* | **XS130B3PAL2** |
| *XS2N30PA340D* | **XS130B3PAM12** |
| *XS2N30PA340L1* | **XS130B3PAL5** |
| *XS2N30PA340L2* | **XS130B3PAL10** |
| *XS2N30PB340* | **XS130B3PBL2** |
| *XS2N30PB340D* | **XS130B3PBM12** |
| *XS2M30NA370* | **XS630B1NAL2** |
| *XS2M30NA370B* | **XS630B1NAL01B** *(4)* |
| *XS2M30NA370C* | **XS630B1NAL01C** *(4)* |
| *XS2M30NA370D* | **XS630B1NAM12** |
| *XS2M30NA370L1* | **XS630B1NAL5** |
| *XS2M30NA370L2* | **XS630B1NAL10** |
| *XS2M30NB370* | **XS630B1NBL2** |
| *XS2M30NB370B* | **XS630B1NBL01B** *(4)* |
| *XS2M30NB370C* | **XS630B1NBL01C** *(4)* |
| *XS2M30NB370D* | **XS630B1NBM12** |
| *XS2M30NB370L1* | **XS630B1NBL5** |
| *XS2M30NB370L2* | **XS630B1NBL10** |
| *XS2M30PA370* | **XS630B1PAL2** |
| *XS2M30PA370A* | **XS630B1PAL01U78** *(4)* |
| *XS2M30PA370B* | **XS630B1PAL01B** *(4)* |
| *XS2M30PA370C* | **XS630B1PAL01C** *(4)* |
| *XS2M30PA370D* | **XS630B1PAM12** |

| *Old sensor* | **New XS sensor** |
|---|---|
| *XS2M30PA370G* | **XS630B1PAL01G** *(4)* |
| *XS2M30PA370L1* | **XS630B1PAL5** |
| *XS2M30PA370L2* | **XS630B1PAL10** |
| *XS2M30PB370* | **XS630B1PBL2** |
| *XS2M30PB370B* | **XS630B1PBL01B** *(4)* |
| *XS2M30PB370C* | **XS630B1PBL01C** *(4)* |
| *XS2M30PB370D* | **XS630B1PBM12** |
| *XS2M30PB370G* | **XS630B1PBL01G** *(4)* |
| *XS2M30PB370L1* | **XS630B1PBL5** |
| *XS2M30PB370L2* | **XS630B1PBL10** |
| ***XS3*** | |
| *XS3P30NA340* | **XS530B1NAL2** *(3)* |
| *XS3P30NA340D* | **XS530B1NAM12** *(3)* |
| *XS3P30NA340L1* | **XS530B1NAL5** *(3)* |
| *XS3P30PA340* | **XS530B1PAL2** *(3)* |
| *XS3P30PA340D* | **XS530B1PAM12** *(3)* |
| *XS3P30PA340L1* | **XS530B1PAL5** *(3)* |
| *XS3P30PA340L2* | **XS530B1PAL10** *(3)* |
| *XS3P30PA370* | **XS530BLPAL2** *(3)* |
| *XS3P30PA370L1* | **XS530BLPAL5** *(3)* |
| *XS3P30PA370L2* | **XS530BLPAL10** *(3)* |
| *XS3P30NA370* | **XS530BLNAL2** *(3)* |
| *XS3P30NA370L1* | **XS530BLNAL5** *(3)* |
| ***XS4*** | |
| *XS4P30NA370B* | **XS4P30NA370L01B** *(4)* |
| *XS4P30NB370B* | **XS4P30NB370L01B** *(4)* |
| *XS4P30NC410L2* | **XS4P30NC410D + XZCPV1141L10** |
| *XS4P30PA370B* | **XS4P30PA370L01B** *(4)* |
| *XS4P30PB370B* | **XS4P30PB370L01B** *(4)* |
| *XS4P30PC410L1* | **XS4P30PC410D + XZCPV1141L5** |
| *XS4P30PC410L2* | **XS4P30PC410D + XZCPV1141L10** |

*(1) For the new sensor an integral M12 connector replaces the remote M12 connector on a 0.80 m flying lead.*
*(3) For the new sensor, the metal case replaces the plastic case.*
*(4) For the new sensor, connectors A, B, C and G on 0.1 m flying lead replace integral connectors A, B, C and G.*
*(5) For the new sensor, Sn = 15 mm instead of 20 mm.*

# Substitution table

## *Sensors with the closest functionalities*

# Inductive proximity sensors

| *Old sensor* | **New XS sensor** |
|---|---|
| **Cylindrical type, AC or DC** | |
| **Diameter 12 mm** | |
| ***XS1*** | |
| *XS1M12MA230* | **XS512B1MAL2** |
| *XS1M12MA230K* | **XS512B1MAU20** |
| *XS1M12MA230L1* | **XS512B1MAL5** |
| *XS1M12MA230L2* | **XS512B1MAL10** |
| *XS1M12MB230* | **XS512B1MBL2** |
| *XS1M12MB230K* | **XS512B1MBU20** |
| *XS1M12MB230L1* | **XS512B1MBL5** |
| *XS1M12MB230L2* | **XS512B1MBL10** |
| *XS1M12MA239* | **XS612B1MAL2** |
| *XS1M12MA239K* | **XS612B1MAU20** |
| ***XS2*** | |
| *XS2M12MA230* | **XS612B1MAL2** |
| *XS2M12MA230K* | **XS612B1MAU20** |
| *XS2M12MA230L1* | **XS612B1MAL5** |
| *XS2M12MA230L2* | **XS612B1MAL10** |
| *XS2M12MB230* | **XS612B1MBL2** |
| *XS2M12MB230K* | **XS612B1MBU20** |
| *XS2M12MB230L1* | **XS612B1MBL5** |
| *XS2M12MB230L2* | **XS612B1MBL10** |
| ***XS3*** | |
| *XS3P12MA230* | **XS612B1MAL2** *(3)* |
| *XS3P12MA230K* | **XS612B1MAU20** *(3)* |
| *XS3P12MA230L1* | **XS612B1MAL5** *(3)* |
| *XS3P12MA230L2* | **XS612B1MAL10** *(3)* |
| *XS3P12MB230* | **XS612B1MBL2** *(3)* |
| *XS3P12MB230K* | **XS612B1MBU20** *(3)* |
| *XS3P12MB230L1* | **XS612B1MBL5** *(3)* |
| **Diameter 18 mm** | |
| ***XS1*** | |
| *XS1M18MA230* | **XS518B1MAL2** |
| *XS1M18MA230A* | **XS618B1MAL01U78** *(4)* |
| *XS1M18MA230B* | **XS618B1MAL01B** *(4)* |
| *XS1M18MA230C* | **XS618B1MAL01C** *(4)* |
| *XS1M18MA230G* | **XS618B1MAL01G** *(4)* |
| *XS1M18MA230K* | **XS518B1MAU20** |
| *XS1M18MA230L1* | **XS518B1MAL5** |
| *XS1M18MA230L2* | **XS518B1MAL10** |
| *XS1M18MB230* | **XS518B1MBL2** |
| *XS1M18MB230A* | **XS618B1MBL01U78** *(4)* |
| *XS1M18MB230B* | **XS618B1MBL01B** *(4)* |
| *XS1M18MB230C* | **XS618B1MBL01C** *(4)* |
| *XS1M18MB230G* | **XS618B1MBL01G** *(4)* |
| *XS1M18MB230K* | **XS518B1MBU20** |
| *XS1M18MB230L1* | **XS518B1MBL5** |
| *XS1M18MB230L2* | **XS518B1MBL10** |
| *XS1M18MA239* | **XS618B1MAL2** *(5)* |

| *Old sensor* | **New XS sensor** |
|---|---|
| **Diameter 18 mm** *(continued)* | |
| ***XS1*** | |
| *XS1M18MA239A* | **XS1M18MA239L01A** *(4)* |
| *XS1M18MA239K* | **XS618B1MAU20** *(5)* |
| ***XS2*** | |
| *XS2M18MA230* | **XS618B1MAL2** |
| *XS2M18MA230A* | **XS618B1MAL01U78** *(4)* |
| *XS2M18MA230B* | **XS618B1MAL01B** *(4)* |
| *XS2M18MA230C* | **XS618B1MAL01C** *(4)* |
| *XS2M18MA230G* | **XS618B1MAL01G** *(4)* |
| *XS2M18MA230K* | **XS618B1MAU20** |
| *XS2M18MA230L1* | **XS618B1MAL5** |
| *XS2M18MA230L2* | **XS618B1MAL10** |
| *XS2M18MB230* | **XS618B1MBL2** |
| *XS2M18MB230A* | **XS618B1MBL01U78** *(4)* |
| *XS2M18MB230B* | **XS618B1MBL01B** *(4)* |
| *XS2M18MB230C* | **XS618B1MBL01C** *(4)* |
| *XS2M18MB230G* | **XS618B1MBL01G** *(4)* |
| *XS2M18MB230K* | **XS618B1MBU20** |
| *XS2M18MB230L1* | **XS618B1MBL5** |
| *XS2M18MB230L2* | **XS618B1MBL10** |
| ***XS3*** | |
| *XS3P18MA230* | **XS618B1MAL2** *(3)* |
| *XS3P18MA230K* | **XS618B1MAU20** *(3)* |
| *XS3P18MA230L1* | **XS618B1MAL5** *(3)* |
| *XS3P18MA230L2* | **XS618B1MAL10** *(3)* |
| *XS3P18MB230* | **XS618B1MBL2** *(3)* |
| *XS3P18MB230A* | **XS618B1MBU20** *(3)* |
| *XS3P18MB230K* | **XS618B1MBU20** *(3)* |
| *XS3P18MB230L1* | **XS618B1MBL5** *(3)* |
| ***XS4*** | |
| *XS4P18MA230B* | **XS4P18MA230L01B** *(4)* |
| *XS4P18MA230C* | **XS4P18MA230L01C** *(4)* |
| *XS4P18MA230G* | **XS4P18MA230L01G** *(4)* |
| *XS4P18MB230B* | **XS4P18MB230L01B** *(4)* |
| *XS4P18MB230C* | **XS4P18MB230L01C** *(4)* |
| **Diameter 30 mm** | |
| ***XS1*** | |
| *XS1M30MA230* | **XS530B1MAL2** |
| *XS1M30MA230A* | **XS630B1MAL01U78** *(4)* |
| *XS1M30MA230B* | **XS630B1MAL01B** *(4)* |
| *XS1M30MA230C* | **XS630B1MAL01C** *(4)* |
| *XS1M30MA230G* | **XS630B1MAL01G** *(4)* |
| *XS1M30MA230K* | **XS530B1MAU20** |
| *XS1M30MA230L1* | **XS530B1MAL5** |
| *XS1M30MA230L2* | **XS530B1MAL10** |
| *XS1M30MB230* | **XS530B1MBL2** |
| *XS1M30MB230A* | **XS630B1MBL01U78** *(4)* |
| *XS1M30MB230B* | **XS630B1MBL01B** *(4)* |

| *Old sensor* | **New XS sensor** |
|---|---|
| **Diameter 30 mm** *(continued)* | |
| *XS1M30MB230C* | **XS630B1MBL01C** *(4)* |
| *XS1M30MB230G* | **XS630B1MBL01G** *(4)* |
| *XS1M30MB230K* | **XS530B1MBU20** |
| *XS1M30MB230L1* | **XS530B1MBL5** |
| *XS1M30MB230L2* | **XS530B1MBL10** |
| *XS1M30MA239* | **XS630B1MAL2** *(5)* |
| *XS1M30MA239A* | **XS1M30MA239L01A** *(4)* |
| ***XS2*** | |
| *XS2M30MA230* | **XS630B1MAL2** |
| *XS2M30MA230A* | **XS630B1MAL01U78** *(4)* |
| *XS2M30MA230B* | **XS630B1MAL01B** *(4)* |
| *XS2M30MA230C* | **XS630B1MAL01C** *(4)* |
| *XS2M30MA230G* | **XS630B1MAL01G** *(4)* |
| *XS2M30MA230K* | **XS630B1MAU20** |
| *XS2M30MA230L1* | **XS630B1MAL5** |
| *XS2M30MA230L2* | **XS630B1MAL10** |
| *XS2M30MB230* | **XS630B1MBL2** |
| *XS2M30MB230A* | **XS630B1MBL01U78** *(4)* |
| *XS2M30MB230B* | **XS630B1MBL01B** *(4)* |
| *XS2M30MB230C* | **XS630B1MBL01C** *(4)* |
| *XS2M30MB230G* | **XS630B1MBL01G** *(4)* |
| *XS2M30MB230K* | **XS630B1MBU20** |
| *XS2M30MB230L1* | **XS630B1MBL5** |
| *XS2M30MB230L2* | **XS630B1MBL10** |
| ***XS3*** | |
| *XS3P30MA230* | **XS630B1MAL2** *(3)* |
| *XS3P30MA230K* | **XS630B1MAU20** *(3)* |
| *XS3P30MA230L1* | **XS630B1MAL5** *(3)* |
| *XS3P30MA230L2* | **XS630B1MAL10** *(3)* |
| *XS3P30MB230* | **XS630B1MBL2** *(3)* |
| *XS3P30MB230K* | **XS630B1MBU20** *(3)* |
| *XS3P30MB230L1* | **XS630B1MBL5** *(3)* |
| ***XS4*** | |
| *XS4P30MA230B* | **XS4P30MA230L01B** *(4)* |
| *XS4P30MA230C* | **XS4P30MA230L01C** *(4)* |
| *XS4P30MA230G* | **XS4P30MA230L01G** *(4)* |
| *XS4P30MB230B* | **XS4P30MB230L01B** *(4)* |
| *XS4P30MB230C* | **XS4P30MB230L01C** *(4)* |

*(3) For the new sensor, the metal case replaces the plastic case.*
*(4) For the new sensor, connectors A, B, C and G on 0.1 m flying lead replace integral connectors A, B, C and G.*
*(5) For the new sensor, Sn = 8 mm instead of 10 mm.*

# Substitution table

## *Sensors with the closest functionalities*

# Inductive proximity sensors

| *Old sensor* | **New XS sensor** |
|---|---|
| **Block type** | |
| **40 x 40 x 70 mm and 40 x 40 x 117 mm** | |
| ***XS7*** | |
| *XS7C40DA210* | **XS7C4A1DPG13** |
| *XS7C40DA210A* | **XS7C4A1DPU78** |
| *XS7C40DA210D* | **XS7C4A1DPM12** |
| *XS7C40DA210H29* | **XS7C4A1DPP20** |
| *XS7C40DA210H7* | **XS7C4A1DPN12** |
| *XS7C40DA214D* | **XS7C4A1DPM12** |
| *XS7C40DP210* | **XS7C4A1DPG13** |
| *XS7C40DP210H29* | **XS7C4A1DPP20** |
| *XS7C40DP210H7* | **XS7C4A1DPN12** |
| *XS7C40FP260* | **XS7C4A1MPG13** |
| *XS7C40FP260A* | **XS7C4A1MPU78** |
| *XS7C40FP260H29* | **XS7C4A1MPP20** |
| *XS7C40FP260H7* | **XS7C4A1MPN12** |
| *XS7C40KPM40* | **XS9C4A1PCG13** |
| *XS7C40KPM40H29* | **XS9C4A1PCP20** |
| *XS7C40KPM40H7* | **XS9C4A1PCN12** |
| *XS7C40MP230* | **XS7C4A1MPG13** |
| *XS7C40MP230A* | **XS7C4A1MPU78** |
| *XS7C40MP230H29* | **XS7C4A1MPP20** |
| *XS7C40MP230H7* | **XS7C4A1MPN12** |
| *XS7C40NC440* | **XS8C4A1NCG13** |
| *XS7C40NC440D* | **XS8C4A1NCM12** |
| *XS7C40NC440H29* | **XS8C4A1NCP20** |
| *XS7C40NC440H7* | **XS8C4A1NCN12** |
| *XS7C40NC449* | **XS8C4A1NCG13** |
| *XS7C40NC449H29* | **XS8C4A1NCP20** |
| *XS7C40NC449H7* | **XS8C4A1NCN12** |
| *XS7C40PC440* | **XS8C4A1PCG13** |
| *XS7C40PC440D* | **XS8C4A1PCM12** |
| *XS7C40PC440H29* | **XS8C4A1PCP20** |
| *XS7C40PC440H7* | **XS8C4A1PCN12** |
| *XS7C40PC449* | **XS8C4A1PCG13** |
| *XS7C40PC449D* | **XS8C4A1PCM12** |
| *XS7C40PC449H29* | **XS8C4A1PCP20** |
| *XS7C40PC449H7* | **XS8C4A1PCN12** |
| *XS7T4DA210* | **XS7C2A1DAM12 + XZCP1141L2** |
| *XS7T4DA214LD* | **XS8C2A1CAM12** |
| *XS7T4DA214LD01* | **XS8C2A1CAM12** |
| *XS7T4DA214LD01W* | **XS8C2A1CAM12 + XSZPKC2** |
| *XS7T4DA214LDW* | **XS8C2A1CAM12 + XSZPKC2** |
| *XS7T4NC440* | **XS8C2A1NCM12 + XZCP1141L2** |
| *XS7T4NC440LD* | **XS8C2A1NCM12** |
| *XS7T4NC440LD01* | **XS8C2A1NCM12** |
| *XS7T4PC440* | **XS8C2A1PCM12 + XZCP1141L2** |
| *XS7T4PC440LD* | **XS8C2A1PCM12** |

| *Old sensor* | **New XS sensor** |
|---|---|
| **40 x 40 x 70 mm and 40 x 40 x 117 mm** *(continued)* | |
| ***XS8*** | |
| *XS8C40DA210* | **XS8C4A1DPG13** |
| *XS8C40DA210H29* | **XS8C4A1DPP20** |
| *XS8C40DA214D* | **XS8C4A1DPM12** |
| *XS8C40DP210* | **XS8C4A1DPG13** |
| *XS8C40DP210H29* | **XS8C4A1DPP20** |
| *XS8C40DP210H7* | **XS8C4A1DPN12** |
| *XS8C40FP260* | **XS8C4A1MPG13** |
| *XS8C40FP260H29* | **XS8C4A1MPP20** |
| *XS8C40FP260H7* | **XS8C4A1MPN12** |
| *XS8C40MP230* | **XS8C4A1MPG13** |
| *XS8C40MP230H29* | **XS8C4A1MPP20** |
| *XS8C40MP230H7* | **XS8C4A1MPN12** |
| *XS8C40NC440* | **XS8C4A1NCG13** |
| *XS8C40NC440H29* | **XS8C4A1NCP20** |
| *XS8C40NC449* | **XS8C4A4NCG13** |
| *XS8C40NC449H29* | **XS8C4A4NCP20** |
| *XS8C40NC449H7* | **XS8C4A4NCN12** |
| *XS8C40PC440* | **XS8C4A1PCG13** |
| *XS8C40PC440D* | **XS8C4A1PCM12** |
| *XS8C40PC440H29* | **XS8C4A1PCP20** |
| *XS8C40PC440H7* | **XS8C4A1PCN12** |
| *XS8C40PC449* | **XS8C4A4PCG13** |
| *XS8C40PC449D* | **XS8C4A4PCM12** |
| *XS8C40PC449H29* | **XS8C4A4PCP20** |
| *XS8C40PC449H7* | **XS8C4A4PCN12** |
| *XS8T4NC440* | **XS8C2A1NCM12 + XZCP1141L2** |
| *XS8T4NC440LD01* | **XS8C2A1NCM12** |
| *XS8T4PC440* | **XS8C2A1PCM12 + XZCP1141L2** |
| *XS8T4PC440L1* | **XS8C2A1PCM12 + XZCP1141L5** |
| *XS8T4PC440L2* | **XS8C2A1PCM12 + XZCP1141L10** |
| *XS8T4PC440LD* | **XS8C2A1PCM12** |
| *XS8T4PC440LD01* | **XS8C2A1PCM12** |
| **40 x 40 x 117 mm** | |
| ***XSCH*** | |
| *XSCH203629* | **XS9C4A2A2G13** |
| *XSCH203629H7* | **XS9C4A2A2N12** |
| *XSCH207629* | **XS9C4A2A1G13** |
| *XSCH207629H7* | **XS9C4A2A1N12** |

# Product reference index

## XS range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AB1FU10135U 118

**X**

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XS106B3NBM8 32
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XS106B3PAL2TQ 32
XS106B3PAM12 32
XS106B3PAM8 32
XS106B3PAM8TQ 32
XS106B3PBL2 32
XS106B3PBM8 32
XS108B3NAL2 32
XS108B3NAL2TQ 32
XS108B3NAM12 32
XS108B3NAM8 32
XS108B3NAM8TQ 32
XS108B3NBL2 32
XS108B3NBM12 32
XS108B3NBM8 32
XS108B3PAL2 32
XS108B3PAL2TQ 32
XS108B3PAM12 32
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XS108B3PBL2 32
XS108B3PBM12 32
XS108B3PBM8 32
XS112B3NAL2 32
XS112B3NAL2TQ 32
XS112B3NAM12 32
XS112B3NAM12TQ 32
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