

Original instructions

# Eden OSSD

## Coded non-contact safety sensor



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- Systems, machines, and equipment that could present a risk to life or property.

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# 1 Introduction

## Scope

The purpose of these instructions is to describe the non-contact coded digital safety sensor Eden OSSD and to provide the necessary information required for installation and operation.

## Audience

This document is intended for authorized installation personnel.

## Prerequisites

It is assumed that the reader of this document has knowledge of the following:

- Basic knowledge of ABB Jokab Safety products.
- Knowledge of machine safety.

## Special notes

Pay attention to the following special notes in the document:

**Warning!**

Danger of severe personal injury!

An instruction or procedure which, if not carried out correctly, may result in injury to the operator or other personnel.

**Caution!**

Danger of damage to the equipment!

An instruction or procedure which, if not carried out correctly, may damage the equipment.

NB: Notes are used to provide important or explanatory information.

## 2 Overview

### General description

Eden OSSD sensor consists of two separate devices – Adam and Eva – intended to use as interlocking device for gates, hatches etc. Eva can be general coded or unique coded.

Eden OSSD meets the coding requirements according to EN ISO 14119:2013 regarding manipulation protection.

### Safety regulations



#### **Warning!**

Carefully read through this entire manual before using the device.

The devices shall be installed by a trained electrician following applicable safety regulations, standards and the Machine directive.

Failure to comply with instructions, operation that is not in accordance with the use prescribed in these instructions, improper installation or handling of the device can affect the safety of people and the plant.

For installation and prescribed use of the product, the special notes in the instructions must be carefully observed and the technical standards relevant to the application must be considered.

In case of failure to comply with the instructions or standards, especially when tampering with and/or modifying the product, any liability is excluded.

### 3 Models of Adam and Eva

Eden communicates with OSSD signals and can be connected to any safety module that handles OSSD-signals. Up to 30 Eden sensors can be connected in series without reducing the achieved performance level. Adam and Eva are acquired separately and it is possible to mix different models of Adam OSSD in the same safety circuit.

#### Adam OSSD

Adam OSSD exists in four different models:



##### Adam OSSD-Info M12-8

OSSD model with information output and inputs for cascade connection.

##### Adam OSSD-Reset M12-8

OSSD model with built in monitored reset, indication lamp output and inputs for cascade connection.

##### Adam OSSD-Info M12-5

OSSD model with information output.

##### Adam OSSD-Reset M12-5

OSSD model with built in monitored reset and indication lamp output.

#### Eva

Eva exists in two different models. The Eva units with general code have all the same code. The Eva units with unique code have all a different unique code. The unique variant fulfils the requirements for a high level coded interlocking device according to EN ISO 14119:2013. The Eva with general code fulfils the requirement for a low level coded interlocking device. It is possible to mix different models of Eva in the same safety circuit.



##### Eva General code

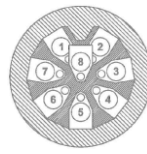
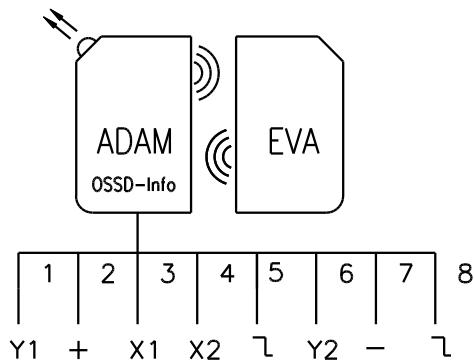
Eva with the same code.

##### Eva Unique code

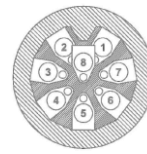
Eva with a unique code.

## 4 Electrical connections

### Adam OSSD-Info M12-8



M12 8-pole male  
from cable side

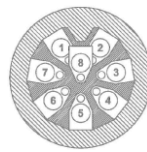
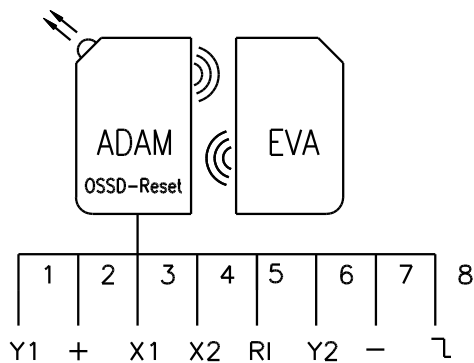


M12 8-pole female  
from cable side

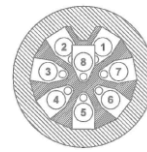
#### M12-connector: (8-pole male)

- 1) White: OSSD signal 1 Out
- 2) Brown: +24 VDC
- 3) Green: OSSD signal 1 In
- 4) Yellow: OSSD signal 2 In
- 5) Grey: Information
- 6) Pink: OSSD signal 2 Out
- 7) Blue: 0 V
- 8) Red: Information

### Adam OSSD-Reset M12-8



M12 8-pole male  
from cable side



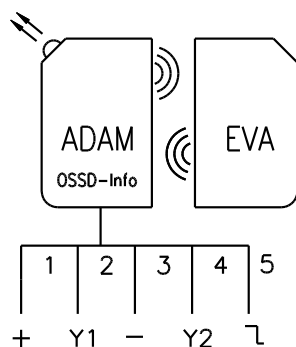
M12 8-pole female  
from cable side

#### M12-connector: (8-pole male)

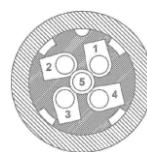
- 1) White: OSSD signal 1 Out
- 2) Brown: +24 VDC
- 3) Green: OSSD signal 1 In
- 4) Yellow: OSSD signal 2 In
- 5) Grey: Reset/Indication
- 6) Pink: OSSD signal 2 Out
- 7) Blue: 0 V
- 8) Red: Information



## Adam OSSD-Info M12-5



M12 5-pole male  
from cable side



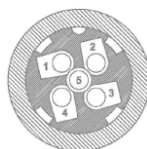
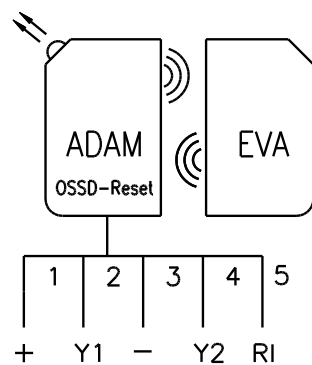
M12 5-pole female  
from cable side

### M12-connector:

(5-pole male)

- 1) Brown: +24 VDC
- 2) White: OSSD signal 1 Out
- 3) Blue: 0 V
- 4) Black: OSSD signal 2 Out
- 5) Grey Information

## Adam OSSD-Reset M12-5



M12 5-pole male  
from cable side



M12 5-pole female  
from cable side

### M12-connector:

(5-pole male)

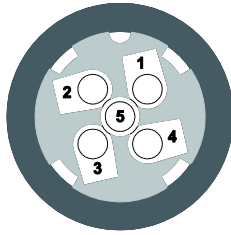
- 1) Brown: +24 VDC
- 2) White: OSSD signal 1 Out
- 3) Blue: 0 V
- 4) Black: OSSD signal 2 Out
- 5) Grey Reset/Indication

NB: The use of shielded cable is mandatory between Adam OSSD and the rest of the safety circuit.

**Caution!** All cable colours according to ABB Jokab Safety standard cables.

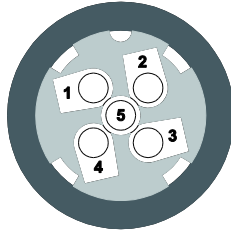
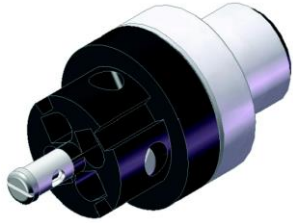
## Connection of cable C5, C8 in M12 C01-C04 connectors

Female 5-pin connector (M12 C01):

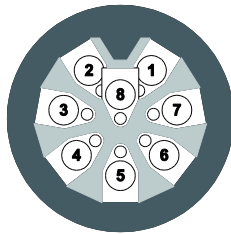
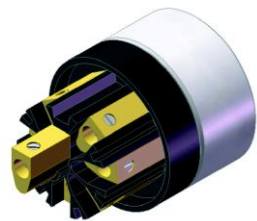


- 1 ) Brown
- 2 ) White
- 3 ) Blue
- 4 ) Black
- 5 ) Grey

Male 5-pin connector (M12 C02):

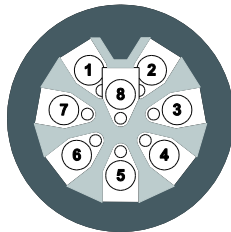
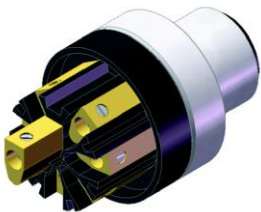


Female 8-pin connector (M12 C03):



- 1 ) White
- 2 ) Brown
- 3 ) Green
- 4 ) Yellow
- 5 ) Grey
- 6 ) Pink
- 7 ) Blue
- 8 ) Red

Male 8-pin connector (M12 C04):



## Information output signal attributes

Adam OSSD-Info is equipped with an information output on pin 5 and pin 8. The information outputs on pin 5 and pin 8 are set high (+24 VDC) when the OSSD-outputs are set high, otherwise they are set low.

The maximum current consumption for the information output is 15 mA.



**Warning!** The information output signal is not a failsafe signal and should **never** be used for the safety purpose(s).

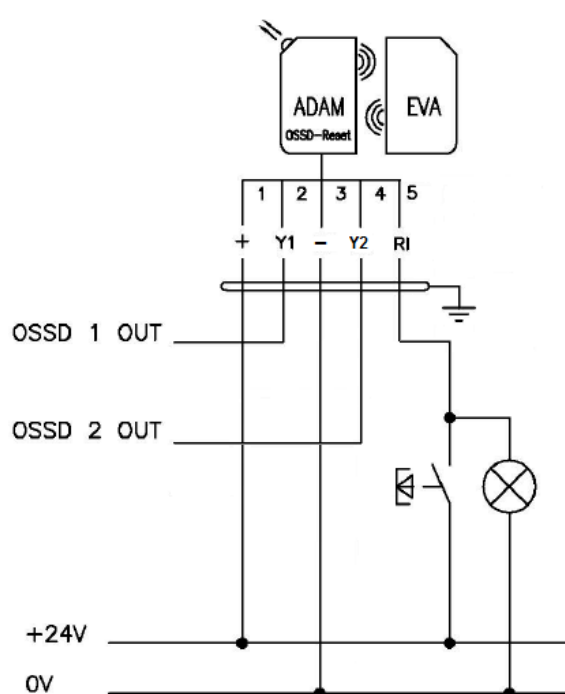
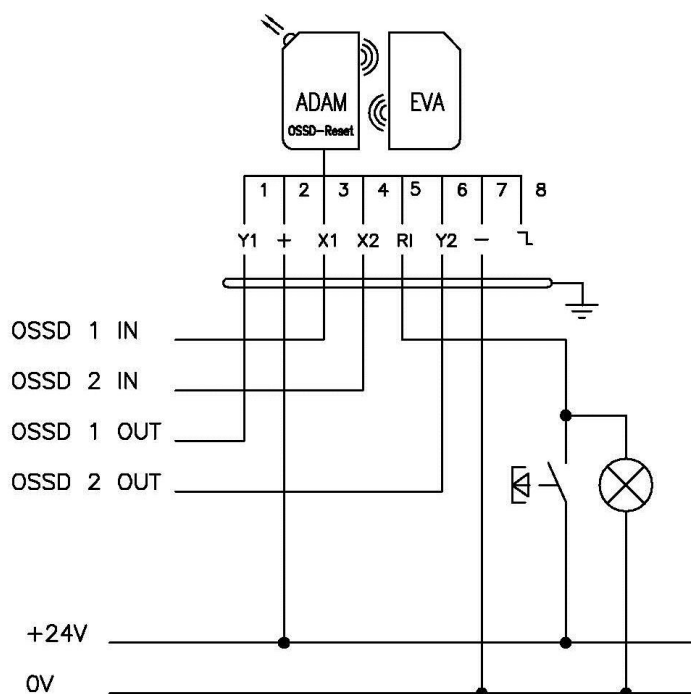
## Connection of Reset button on Adam OSSD-Reset

Adam OSSD-Reset is a model prepared for monitored local reset. A reset light button can be connected to pin 5 and Adam OSSD handles the monitored reset and the indication lamp of the reset button. Each Eden with a local reset can be reset individually and independently of the others. Only when all Eden units in the safety circuit have been reset, the safety circuit itself is reset and the machine can be restarted.

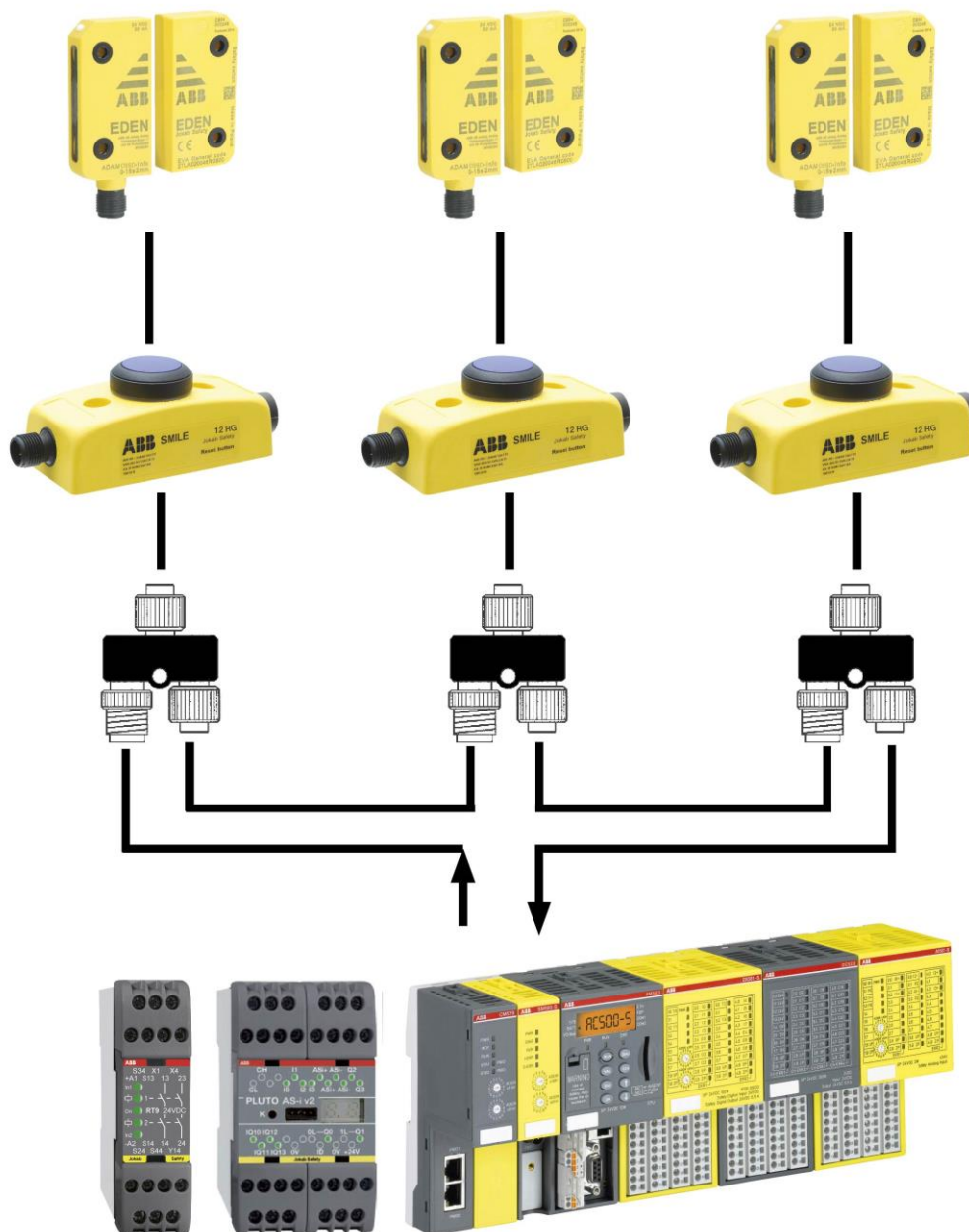
Any button with a NO-contact and an indication lamp can be used. See electrical connection below. The maximum current consumption for the indication lamp is 30 mA. Smile 12RF and Smile 12RG are reset buttons with indication lamps from ABB Jokab Safety indented to be used together with Adam OSSD-Reset.

The reset signal is accepted as valid only when the reset signal is high for more than 100 ms but less than 3 s.

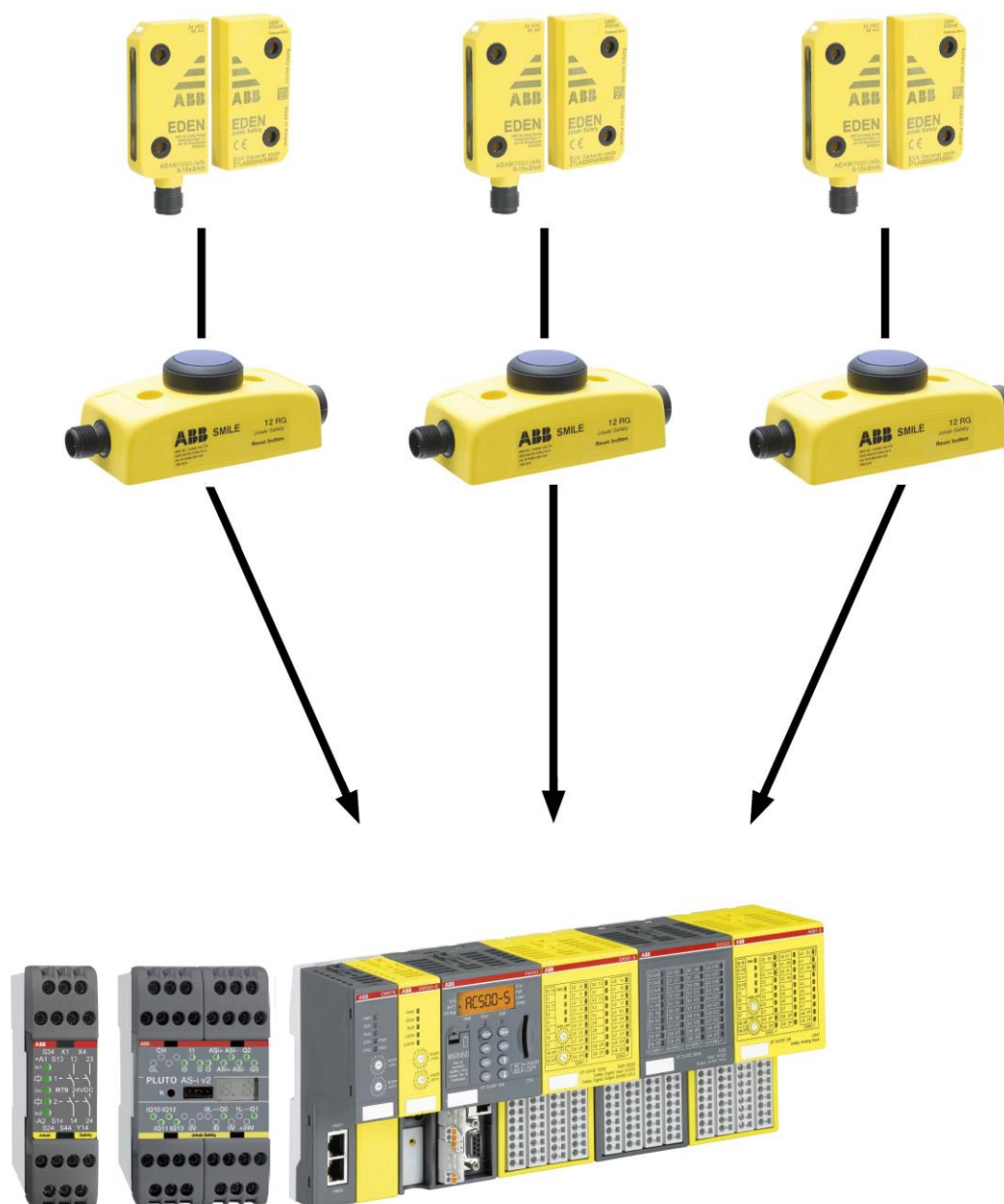
| Reset indication lamp status  | Description   |
|-------------------------------|---|
| On:                           | No valid Eva is detected, safety circuit is open.                   |
| Flash (0.4 s ON / 0.6 s OFF): | Valid Eva is detected. Waiting for reset.                           |
| Off:                          | The reset button has been pressed and the safety circuit is closed. |



**Warning!** Several Eden must not be connected in parallel to a common reset button. Each Eden must be separately connected to a local reset.



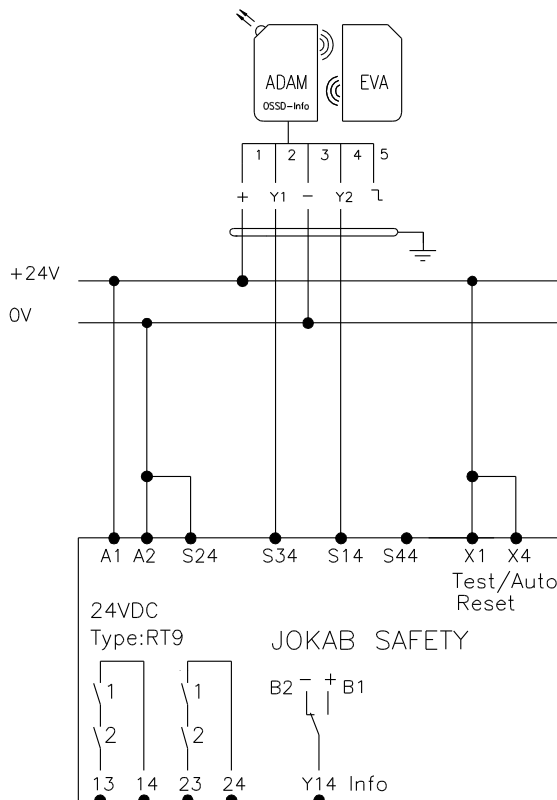
Serial connection of three Adam OSSD-Reset M12-8 through M12-3G with Smile 12RG to a safety relay, Pluto or another safety-PLC (i.e. ABB AC500-S).



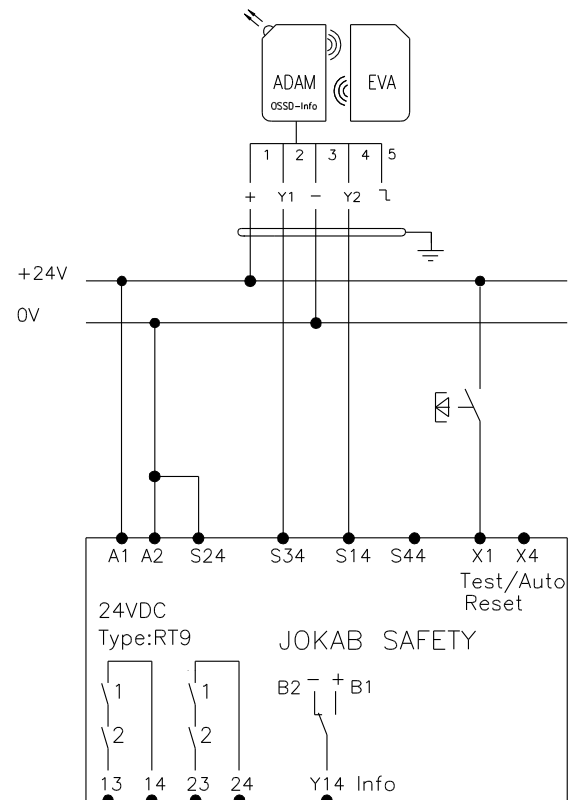
Individual connection of three Adam OSSD-Reset M12-5 with Smile 12RF to a Pluto or another safety-PLC (i.e. ABB AC500-S).

## 5 Connection examples

### Adam OSSD-Info connected to RT9

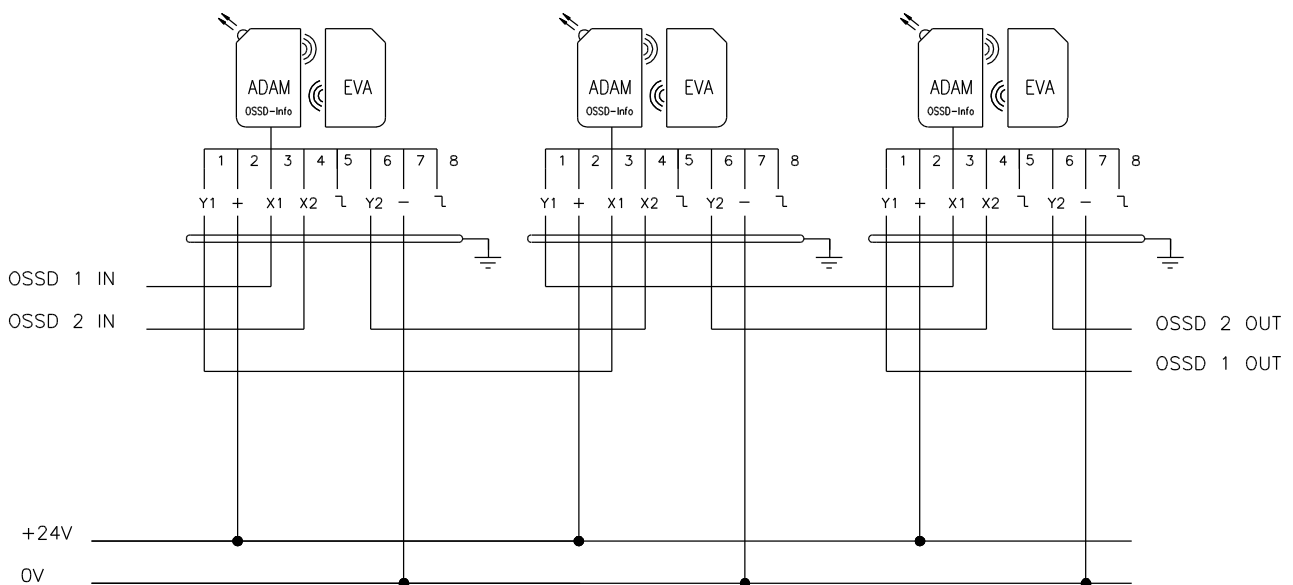


A) Adam OSSD-M12-5 connected to RT9 with automatic reset.



B) Adam OSSD-M12-5 connected to RT9 with manual reset.

### Several Adam OSSD-Info connected in series



A) Three Adam OSSD-M12-8 connected in series.

## 6 Installation

### General information

#### Warning!

All the safety functions must be tested before starting up the system.

- Note that the detection distance can be affected when Eden is mounted close to metal.
- The Eden can be mounted on metal, but should not be surrounded.
- The  $S_{ar}$  distance should be used in calculations (e.g. for minimum safety distance).
- Verify that Adam and Eva are aligned in parallel to each other.

### Minimum safety distance

When using interlocking guards without guard locking to safeguard a hazard zone, the minimum allowed safety distance between the guarded opening and the hazardous machine must be calculated. In order to ensure that the hazardous machine motion will be stopped before it can be reached, the minimum safety distance is calculated according to EN ISO 13855:2010 ("Positioning of safeguards with respect to the approach speeds of parts of the human body").

The minimum safety distance is calculated according to the formula:

$$S = (K \times T) + C$$

Where

**S** = minimum safety distance (mm).

**K** = approach speed of a human body; 1 600 mm/s.

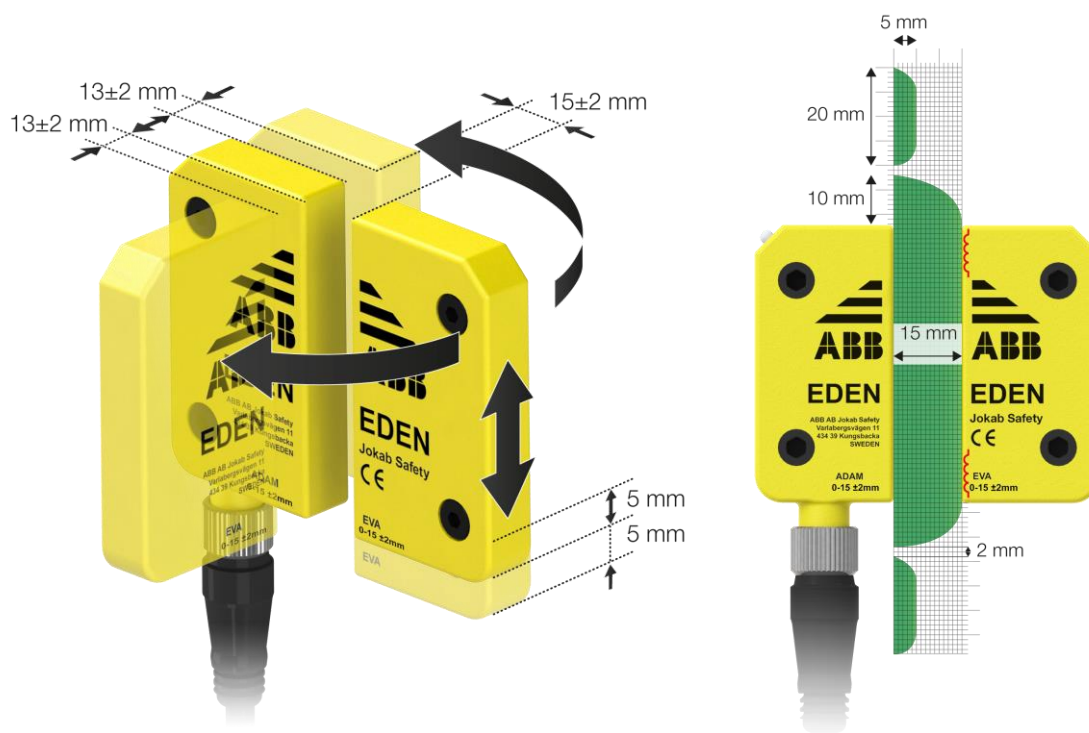
**T** = the total time from opening of the guard until the hazardous machine movement has stopped, i.e. including control system reaction times and other delay(s).

**C** = a safety distance taken from Table 4 or Table 5 of EN ISO 13857:2008, if it is possible to push fingers or a hand through the opening towards the hazard before a stop signal is generated.

NB: In some cases, **T** might be reduced by the opening time of the guard until the opening size permits access of the relevant parts of the body. Refer to EN ISO 13855:2010 for further details and EN ISO 13857:2008 for specified values.

## Detection distance

Eva can be turned in a number of different ways relative to Adam, see details in the figure below. The green fields in the picture show the detection distance of Adam relative to Eva. The safety signal is high when the two coils in Eva is in contact with the green field.



The figure above shows maximum detection distances.

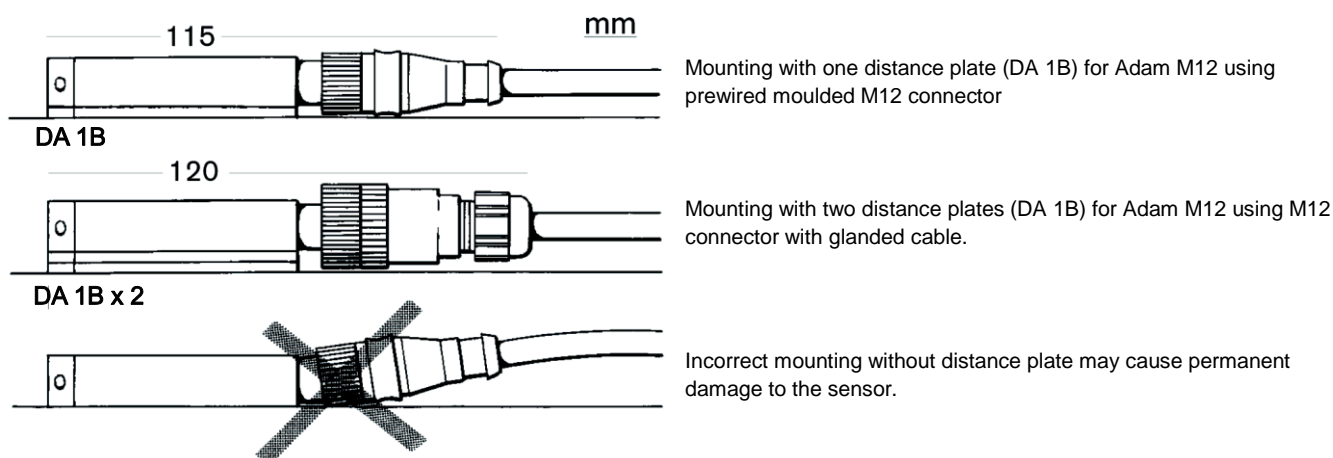
|  |                  |
|--|------------------|
| Detection distance between Adam and Eva:   | 0–15 mm +/- 2 mm |
| Recommended distance between Adam and Eva: | 7 mm             |
| Minimum distance between two Eden pairs:   | 100 mm           |

**Caution!** The detection distance can be affected if Eden is mounted close to metal. Distance plate DA 1B should be used to prevent the effect.



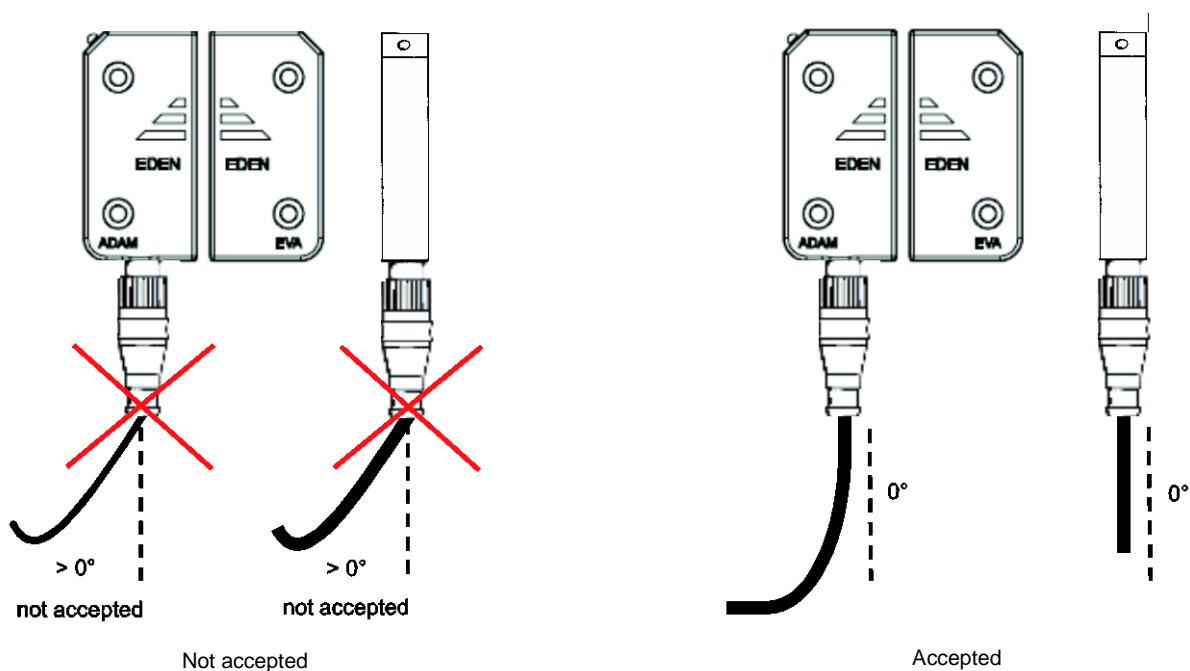
## Mounting

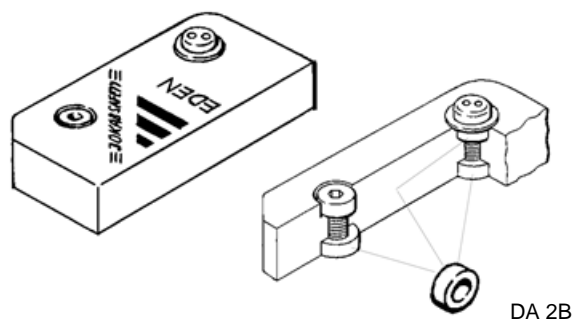
Depending on the cable connector used for the connection to Eden, one or two distance plates might be required for correct mounting in order to avoid damaging Adam. It is recommended to use the distance plates (DA 1B) supplied with the Adam models with M12 connector (Adam M12), see figure below. Also, the mounting spacers supplied must be used in order to physically protect Eden from damage.



The cable should be mounted so that no force is applied on Adam in any directions. The cable should be fixed if it's connected to a moving object, for example a cable chain or a door. This can be done with for example two cable clamps.

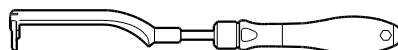
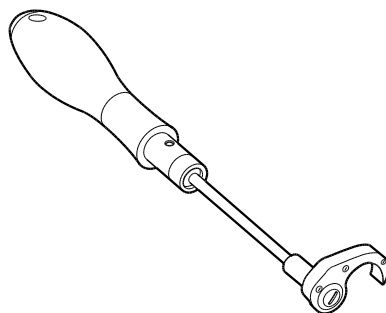
**Caution!** An improperly installed cable can damage the sensor.





### Mounting procedure:

1. Fasten each sensor with two M4 screws. Safety screw SM4x20 (2TLA020053R4200) is recommended. The DA 2B mounting spacer must be used in order to physically protect Eden from damage.
2. Use max tightening torque 0.8 Nm on screws.
3. Lock screw with Loctite or similar if necessary to prevent easy dismounting (refer to risk assessment).
4. Tighten the M12 contact with tightening torque 0.6 Nm. A torque wrench is recommended to ensure a tight connection and IP69K.



Torque Wrench for M12-connector.

## Teaching the code

Adam is delivered without code and need to be programmed with the code from an Eva (General or Unique coded). The code of the first Eva detected by the Adam is automatically programmed as soon as Eva is within the detection distance. If Adam is programmed to accept an Eva with a general code, it will accept all Eva units with a general code. If it is programmed to accept an Eva with unique code, it will only accept the unique code of that specific Eva.

Note that it is possible to teach more than one Adam unit to accept the same Eva unit. This is for example applicable on a sliding door or for machine positioning.

How to program a new Adam without code, to accept a new Eva:

1. Bring the Eva in the range of Adam.
2. Connect the Adam without code to the power supply.
3. The LED on Adam will turn green when the programming procedure is finished.

NB: The programming procedure is taking place only at startup of Adam. Eva must be in range at this time.

NB: If the teaching procedure fails, Adam enters a fail-safe mode and its red LED starts flashing fast. Erase the code, cycle the power and restart the teaching code procedure.

**Caution!** The Eva must not be removed during the teaching procedure.

## How to erase existing codes from Adam M12-5

1. Remove Eva from Adam's detection range.
2. Disconnect the power supply on pin 1 on the Adam unit.
3. Connect +24 VDC to pin 2 and 4.
4. Connect the power supply on pin 1 on the Adam unit.
5. After 5-10 s disconnect pin 2 and 4 from +24 VDC.
6. The Adam unit will now be reset and its LED will flash red.
7. Follow normal installation procedure to install Adam again.

NB: If the pin 2 and 4 on the Adam unit is not disconnected from +24 VDC within 5–10 s, Adam enters the fail-safe mode and the red LED starts flashing fast. It is then necessary to restart the procedure from the beginning.

## How to erase existing codes from Adam M12-8

1. Remove Eva from Adam's detection range.
2. Disconnect the power supply on pin 2 on the Adam unit.
3. Connect +24 VDC to pin 1 and 6.
4. Connect the power supply on pin 2 on the Adam unit.
5. After 5-10 s disconnect pin 1 and 6 from +24 VDC.
6. The Adam unit will now be reset and its LED will flash red.
7. Follow normal installation procedure to install Adam again.

NB: If pin 1 and 6 on the Adam unit are not disconnected from +24 VDC within 5-10 s, Adam enters the fail-safe mode and the red LED starts flashing fast. It is then necessary to restart the procedure from the beginning.

## Replacing Eva

When an Eva should be replaced, the used one needs to be deleted from the Adam sensor. To delete Eva from the internal memory, follow below instructions.

1. Remove Eva out of sensing distance.
2. Disconnect the power supply from Adam (0 V should remain connected)\*.
3. Connect +24 VDC to OSSD1 Output and OSSD2 Output.
4. Connect the power supply (+24 VDC) to Adam. The LED will turn red.
5. When the LED turns green after 5–10 s, disconnect the voltage from OSSD1 Output and OSSD2 Output. The Adam sensor is restored and the LED flashes in red.
6. Disconnect the power supply from Adam.
7. Move Eva within sensor distance and connect the power supply to Adam. The green LED is lighted and the teaching of Eva's code into Adam is done.

NB: If OSSD1 Output and OSSD2 output on the Adam are not disconnected from +24 VDC within 5–10 sec, Adam enters the fail-safe mode and the red LED starts flashing fast. It is then necessary to restart the procedure from the beginning.

## Testing the safety functions

Make sure the safety unit and safety module is working properly by following these steps:

1. Interrupt Eden output by moving Eva away from Adam. The LED will light red when Eva is out of range of Adam.
2. Interrupt the OSSD safety circuit before the unit to be tested. The LED will flash between green and red.
3. Move Eva to a position next to Adam. The LED will light green if the safety circuit(s) before this unit is not interrupted.
4. An additional function test can be made by slowly moving Eva away from Adam. The LED will flash fast green when Eva is 2 mm from the maximum detection distance to Adam.

\* Be aware that if the voltage is disconnected at mains and not after the power supply, the charge may keep the voltage at higher level for a longer period of time. Always check that the voltage level has reached < 1.0 V before reconnecting it.

## 7 LED indication

The non-safe status LED on Adam shows the status of the Eden sensor and the output status as follows:

| LED on Adam            | Description  | Safety circuit |
|------------------------|--|----------------|
| Green                  | Valid Eva within range                                       | Closed         |
| Flashing green         | Valid Eva within range, waiting for reset                    | Open           |
| Flashing red/green     | Valid Eva within range, no valid in signal                   | Open           |
| Red                    | Valid Eva out of range                                       | Open           |
| Fast flashing green    | Valid Eva is within 2 mm from the maximum detection distance | Closed         |
| Fast flashing red      | Fail-safe mode   | Open           |
| Flashing red           | No Eva programmed  | Open           |
| Flashing red/red/green | Input channel fault  | Open           |

## 8 Maintenance

**Warning!** The safety functions and the mechanics shall be tested regularly, at least once every year to confirm that all the safety functions are working properly (EN 62061:2005).

**Warning!** In case of breakdown or damage to the product, contact ABB Jokab Safety. Do not try to repair the product. It might accidentally cause permanent damage, impairing the safety of the device and in turn lead to serious personnel injuries.

### Troubleshooting

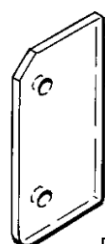
| LED on Adam                                | Expected causes of faults                            | Checking and measures to take  |
|--|--|--|
| Lights red                                 | Eva away   | Move Eva closer to Adam.   |
|  | Metal between Adam and Eva                           | Remove the metal.  |
| No light                                   | Loss of power supply                                 | Check +24 VDC / 0 V power supply   |
| Lights green (but no OSSD output detected) | Defect OSSD signal input to unit (asymmetric pulses) | Check the OSSD input or the unit before in the safety circuit.   |
| Lights green/red (flashing)                | No OSSD input (Eva in position with Adam)            | Check the unit before in the safety circuit (make it active).  |
| Fast flashing red                          | Fail-safe mode                                       | The programming of the code from Eva to Adam could have failed. Erase the code, place Eva next to Adam and then cycle the power. In other cases the unit needs to be replaced. |

## 9 Model overview

| Type                  | Article number  | Description                                 |
|-----------------------|-----------------|---|
| Adam OSSD-Info M12-5  | 2TLA020051R5400 | Pin 5: Information                          |
| Adam OSSD-Info M12-8  | 2TLA020051R5700 | Pin 5 and 8: Information                    |
| Adam OSSD-Reset M12-5 | 2TLA020051R5600 | Pin 5: Reset/Indication                     |
| Adam OSSD-Reset M12-8 | 2TLA020051R5900 | Pin 5: Reset/Indication, Pin 8: Information |
| Eva General code      | 2TLA020046R0800 | General code                                |
| Eva Unique code       | 2TLA020046R0900 | Unique code                                 |

### Accessories

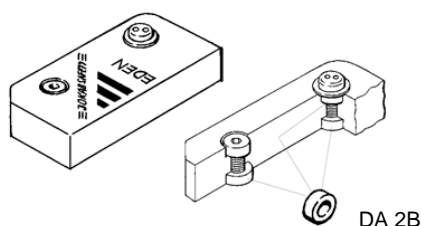
| Type                    | Article number  | Description                            |
|-------------------------|-----------------|--|
| DA 1                    | 2TLA020053R0000 | Distance plate in clear polycarbonate  |
| DA 1B                   | 2TLA020053R0700 | Distance plate in yellow PBT           |
| DA 2B                   | 2TLA020053R0300 | Mounting spacer                        |
| SM4x20                  | 2TLA020053R4200 | Safety screw for mounting Adam and Eva |
| SBITS                   | 2TLA020053R5000 | Safety screwdriver bit                 |
| Smile 12RG Reset button | 2TLA030053R2700 | Reset button for Eden with 8 pins      |
| Smile 12RF Reset button | 2TLA030053R2600 | Reset button for Eden with 5 pins      |
| M12-3G                  | 2TLA020055R0700 | Y-connector for serial connection      |
| Torque wrench           | 2TLA020053R0900 | For M12 contact                        |



Distance plate (DA 1B)



Safety screws and  
screwdriver bit



DA 2B

## Cables

| Type      | Article number  | Description  |
|-----------|-----------------|--|
| M12-C61   | 2TLA020056R0000 | 6 m cable 5 x 0.34 mm <sup>2</sup><br>Shielded cable with straight M12 female connector  |
| M12-C101  | 2TLA020056R1000 | 10 m cable 5 x 0.34 mm <sup>2</sup><br>Shielded cable with straight M12 female connector.  |
| M12-C201  | 2TLA020056R1400 | 20 m cable 5 x 0.34 mm <sup>2</sup><br>Shielded cable with straight M12 female connector.  |
| M12-C112  | 2TLA020056R2000 | 1 m cable 5 x 0.34 mm <sup>2</sup><br>Shielded cable with straight M12 female connector and male connector.<br>Shielded cable connected to pin 3 (0 V) on male connector.  |
| M12-C312  | 2TLA020056R2100 | 3 m cable 5 x 0.34 mm <sup>2</sup><br>Shielded cable with straight M12 female connector and male connector.<br>Shielded cable connected to pin 3 (0 V) on male connector.  |
| M12-C612  | 2TLA020056R2200 | 6 m cable 5 x 0.34 mm <sup>2</sup><br>Shielded cable with straight M12 female connector and male connector.<br>Shielded cable connected to pin 3 (0 V) on male connector.  |
| M12-C1012 | 2TLA020056R2300 | 10 m cable 5 x 0.34 mm <sup>2</sup><br>Shielded cable with straight M12 female connector and male connector.<br>Shielded cable connected to pin 3 (0 V) on male connector. |
| M12-C2012 | 2TLA020056R2400 | 20 m cable 5 x 0.34 mm <sup>2</sup><br>Shielded cable with straight M12 female connector and male connector.<br>Shielded cable connected to pin 3 (0 V) on male connector. |
| M12-C63   | 2TLA020056R3000 | 6 m cable 8 x 0.34 mm <sup>2</sup><br>Shielded cable with straight M12 female connector.   |
| M12-C103  | 2TLA020056R4000 | 10 m cable 8 x 0.34 mm <sup>2</sup><br>Shielded cable with straight M12 female connector.  |
| M12-C203  | 2TLA020056R4100 | 20 m cable 8 x 0.34 mm <sup>2</sup><br>Shielded cable with straight M12 female connector.  |
| M12-C134  | 2TLA020056R5000 | 1 m cable 8 x 0.34 mm <sup>2</sup><br>Shielded cable with straight M12 female connector and male connector.  |
| M12-C334  | 2TLA020056R5100 | 3 m cable 8 x 0.34 mm <sup>2</sup><br>Shielded cable with straight M12 female connector and male connector.  |



M12-C312



## 10 Technical data

| Manufacturer                                  |   |
|---|---|
| Address                                       | ABB JOKAB SAFETY<br>Varlabergsvägen 11<br>S-434 39 Kungsbacka<br>Sweden |
| Power supply                                  |   |
| Rated operating voltage                       | +24 VDC +15 % -40 %   |
| Total current consumption                     | 30 mA at +24 VDC<br>35 mA at 18 VDC<br>45 mA at 12 VDC                  |
| Pin 5 (Information/reset button pin)          | Max 30 mA (VCC – 4 V)   |
| Pin 8 (Information)                           | Max 15 mA (VCC – 4 V)   |
| OSSD outputs (signal 1 and 2 Out)             | Max 50 mA per output (VCC – 4 V).                                       |
| Electrical data                               |   |
| Voltage drop (OSSD. out)                      | 2.5 V at 25 mA at 50 mA   |
| OFF-state current (OSSD. out)                 | < 3 µA  |
| Transponder frequency                         | 4 MHz   |
| Max. switching frequency                      | 1 Hz  |
| Environmental data                            |   |
| EMC   | EN 60947-5-3:1999+A1:2005   |
| Ambient temperature                           | Storage: -40...+70°C<br>Operation: -40...+70°C                          |
| Humidity range                                | 35 % to 85 % (with no icing or condensation)                            |
| Times   |   |
| Switch-on delay power on                      | 2 s   |
| Response time at activation                   | < 150 ms  |
| Response time at deactivation                 | First unit: < 30 ms<br>For each added units: < 5 ms                     |
| Risk time                                     | First unit: < 30 ms<br>For each added units: < 5 ms                     |
| Mechanical data                               |   |
| Protection class                              | IP67/IP69K  |
| Enclosure type rating                         | Type 1  |
| Material                                      | Housing: Polybutylene terephthalate (PBT)<br>Moulding: Epoxy            |
| Connector                                     | M12 8-pole male<br>M12 5-pole male                                      |
| Size  | See drawings below  |
| Weight  | Adam M12: 80 g<br>Eva: 70 g   |
| Colour  | Yellow, grey text   |
| Detection distance (Hysteresis 1–2 mm)        | 0–15 +/- 2 mm   |
| Assured release distance (S <sub>ar</sub> )   | 25 mm   |
| Assured operating distance (S <sub>ao</sub> ) | 10 mm   |

## Safety / Harmonized Standards

|                           |  |
|---------------------------|--|
| Intended use UL           | Applications according to NFPA 79  |
| EN 61508:2010             | SIL3, PFHd: $4,5 \times 10^{-9}$   |
| EN 62061:2005             | SIL3   |
| EN ISO 13849-1:2008       | Category 4, PLe  |
| EN 60947-5-3:1999+A1:2005 | PDF-M  |
| EN ISO 14119:2013         | Type 4, high level coded (Eva Unique code)<br>Type 4, low level coded (Eva General code) |
| Certificates              | TÜV süd pending, cULus   |

## Guideline for chemical resistance

| Chemicals                             | Eden OSSD  |
|---------------------------------------|------------|
| <b>Hydrocarbons</b>                   |            |
| aliphatic                             | Good       |
| aromatic                              | Good       |
| halogenated                           |            |
| - fully                               | Poor/Fair  |
| - partly                              | Poor       |
| <b>Alcohols</b>                       | Good       |
| <b>Phenols</b>                        | Poor       |
| <b>Ketones</b>                        | Fair/Good  |
| <b>Amines</b>                         | Not tested |
| <b>Esters</b>                         | Fair/Good  |
| <b>Ethers</b>                         | Good       |
| <b>Acids</b>                          |            |
| inorganic                             | Good       |
| organic                               | Fair       |
| oxidizing                             | Poor       |
| <b>Alkalies</b>                       | Poor       |
| <b>Automotive fluids</b>              |            |
| Greases (non-reactive organic esters) | Very good  |
| Oils (unsaturated aliphatic mixtures) | Very good  |
| Waxes (heavy oils)                    | Very good  |
| Petrol                                | Very good  |
| Cooling liquid (glycol)               | Very good  |
| Brake fluid (heavy alcohol)           | Good       |
| Detergents, cleaners                  | Good       |
| <b>Water</b>                          |            |
| hot (> 80°C)                          | Poor       |
| <b>Environmental</b>                  |            |
| UV                                    | Good       |

### Very good

- Found unaffected in its performance with regard to time, temperature and stress.

### Good

- Found acceptable in normal exposure.
- Long term exposure may result in minor loss of properties.
- Higher temperatures may result in major loss of properties.

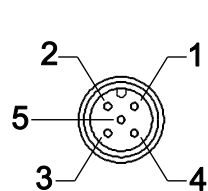
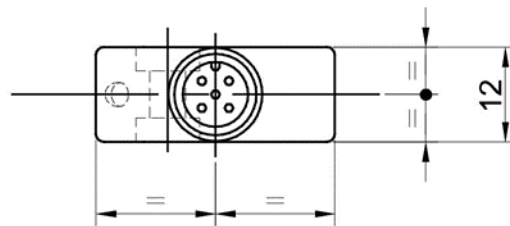
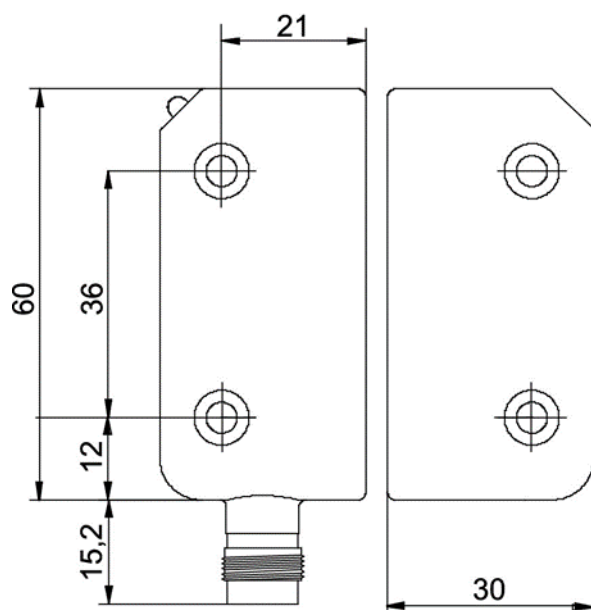
### Fair

- Only for short exposures at lower temperatures or when loss of mechanical properties is not critical.

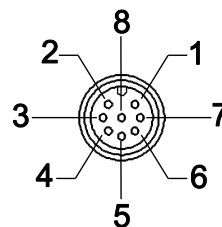
### Poor

- Will result in failure or severe degradation.

## Eden dimensions



Adam M12, 5 pole female. Contact seen from cable side.



Adam M12, 8 pole female. Contact seen from cable side.

NB: All dimensions in millimetres.

## CAD model

For CAD models please visit [www.abb.com/jokabsafety](http://www.abb.com/jokabsafety)

## 11 EC Declaration of conformity



### EC Declaration of conformity

(according to 2006/42/EC, Annex 2A)

|  |   |
|--|---|
| <p>We ABB AB<br/>JOKAB Safety<br/>Varlabergsgatan 11<br/>SE-434 39<br/>Kungsbäcka<br/>Sweden</p> | <p>declare that the safety components of ABB AB manufacture with type designations and safety functions as listed below, is in conformity with the Directives<br/>2006/42/EC<br/>2004/108/EC<br/>2011/65/EU</p> |
|--|---|

|   |   |
|---|---|
| <p>Authorised to compile the technical file</p> | <p>ABB AB<br/>JOKAB Safety<br/>Varlabergsgatan 11<br/>SE-434 39 Kungsbäcka<br/>Sweden</p> |
|---|---|

#### Product

Non-contact safety sensor  
Eden OSSD (Adam, Eva)

|                                  |  |
|----------------------------------|--|
| <p>Used harmonized standards</p> | <p>EN ISO 12100:2010, EN ISO 13849-1:2008, EN 62061:2005,<br/>EN 60204-1:2006+A1:2009, EN 60664-1:2007, EN 61000-6-2:2005,<br/>EN 61000-6-4:2007, EN 60947-5-3:1999+A1:2005,<br/>EN ISO 14119:2013</p> |
|----------------------------------|--|

|                             |                      |
|-----------------------------|----------------------|
| <p>Other used standards</p> | <p>EN 61508:2010</p> |
|-----------------------------|----------------------|



Jesper Kristensson  
PRU Manager  
Kungsbäcka 2015-06-18

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[www.abb.com/jokabsafety](http://www.abb.com/jokabsafety)

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