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# Sensors and locks



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# Introduction and overview

## Selection guide

ABB has a full range of switches for monitoring doors and hatches, both with and without locking function.

	Eden	Sense	MKey
<b>Image</b>			
<b>Function</b>	Interlock	Interlock	Interlock and process/safety lock
<b>Type</b>	Non-contact switch	Magnetic non-contact switch	Mechanical switch
<b>Description</b>	The original non-contact sensor with unique fault-detection capabilities.	Coded magnetic switch in stainless steel for harsh environments.	A classic and well-tried solution.
<b>Applications</b>	Monitoring doors and hatches. Ideal for use in harsh environments such as food and beverage. Also for monitoring of end positions of e.g. an overhead crane.	Monitoring doors and hatches in applications where a stainless steel product is required.	Monitoring doors and hatches. Also available with safe locking.
<b>Advantage</b>	<ul style="list-style-type: none"> <li>- Flexible mounting</li> <li>- M12 connectors</li> <li>- IP69K for harsh environments</li> <li>- One switch to reach Cat. 4</li> <li>- Unique coding to prevent defeat</li> <li>- Local reset minimizes cabling</li> <li>- Non-contact eliminates wear</li> </ul>	<ul style="list-style-type: none"> <li>- Stainless steel</li> <li>- IP69K for harsh environments</li> <li>- Extreme temperature range</li> <li>- Coded sensor</li> <li>- Non-contact eliminates wear</li> </ul>	<ul style="list-style-type: none"> <li>- Holds the door closed</li> <li>- Possible to lock</li> </ul>

	Magne	GKey
Image		
Function	Interlock and process lock	Interlock and safety lock
Type	Electromagnetic lock	Mechanical safety lock
Description	A robust magnetic lock with strong holding force.	A robust safety lock with die cast housing.
Applications	Locking doors and hatches to prevent interruption of machines with short stopping time e.g. robotics applications.	Safe locking of hinged and sliding doors for machines with a long stopping time.
Advantage	<ul style="list-style-type: none"> <li>- Robust design with good sealing</li> <li>- M12 connectors.</li> </ul>	<ul style="list-style-type: none"> <li>- Safe locking</li> <li>- Robust design</li> <li>- Room to integrate 22 mm pilot devices</li> <li>- Rear escape release</li> <li>- High level coding</li> <li>- Lockout function</li> <li>- Manual unlocking (auxiliary release)</li> </ul>

## Introduction and overview

### Selection orientation

## The difference between locking and interlocking functions

### Interlocking function

An interlocking function indicates if a door is open or closed. When the door is open the interlocking function also prevents dangerous machine functions, but it does not prevent the door from being opened.



Interlocking function e.g. Eden

### Locking function

A locking function prevents the door from being opened until an unlocking signal has been sent.



Locking function e.g. Magne

### When to use interlocking and locking functions

An interlocking function is required if the dangerous machine functions needs to be stopped when someone enters the dangerous area.

A locking function is required if a user can open a door/hatch and reach the dangerous machine parts before the dangerous machine functions have ceased. It is also required if the process needs to be protected from unwanted stops that would occur if a person could open a door in the middle of a critical stage of the process..

## The difference between a process lock and a safety lock

All locks of the ABB Jokab Safety range can be used as process locks but only GKey and the models of MKey that uses power to unlock can be used as safety locks. Here is why:

A **process lock** protects the process. One example of an application is a lock on a door giving access to a machine with short stopping time, e.g. a welding machine. The door should not be unlocked before the end of the welding cycle. Should the door be unlocked before the end of the cycle (as a consequence of a fault in the installation like a loss of power or a short-circuit) the door could be opened, which would result in a process stop. It might take a long time to restart the process, but no person would have had time to come close to the danger or get injured. Since the lock only protects the process there is no need for a safe locking signal.



Process lock e.g. Magne

A **safety lock** protects people. One example of an application is a lock on a door giving access to a dangerous machine with a long stopping time, e.g. a circular saw. The door should never be unlocked before the dangerous movement has stopped, not even as a consequence of a fault in the installation like a loss of power or a short-circuit. Should the door be unlocked before the machine has stopped, a person could open the door and have time to get close to the dangerous movement and get injured. Since the lock is protecting the person, the unlocking signal should be safe.

Since a loss of power should not unlock a safety lock, only locks that require power to unlock (e.g. +24 VDC) can be used as safety locks.



Safety lock e.g. GKey



# Non-contact safety sensor

## Eden

Eden is a non-contact safety sensor used as interlocking device for e.g. doors and safe position monitoring.

Eden consists of two parts: Adam and Eva. Adam senses the presence of Eva without mechanical contact and therefore without any wear. The compact size of Eden and its 360° mounting possibility make it easy to use in most applications.

Different models of Eden are available for different types of control modules. All Eden models make it very easy to reach PL e, often using fewer components than other solutions.

All Eden models have an IP67/IP69K sealing.



Continuous operation

### Easier troubleshooting

Extensive LED indication and status information reduce downtime.

### Suitable in harsh environments

IP67/IP69K and a temperature range of -40 to +70°C offer an excellent resistance in demanding environments.

### No wear, no mechanical breakage

Non-contact sensing means no mechanical wear and the large sensing tolerance gives a better tolerance to vibrations, resulting in fewer unwanted process stops.



Affordable range

### Local reset function

The integrated reset function reduces the number of cables and PLC inputs.

### PL e with fewer components

Series connection with PL e, local reset and DYNlink signal allow to considerably reduce the number of components needed to reach PL e.



Easy to install

### Large mounting tolerance

A 360° mounting possibility with generous tolerances facilitates mounting.

### Fast connection

M12 connectors, local reset and accessories speed up installation.

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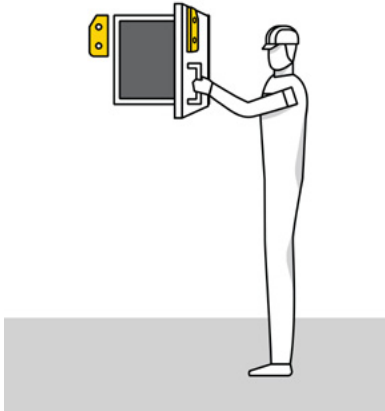
## Applications

Eden

### Applications

#### Doors and hatches

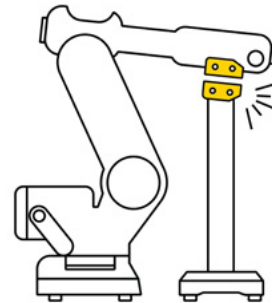
Eden monitors whether the hatch is open or closed. The dangerous movement is stopped as soon as the hatch is opened.



#### Position control

Eden can be used to monitor the position of a machine when someone is in the work area. This can be useful when removing power to the machine causes problems like a long restart time.

As long as the machine remains in the safe position monitored by Eden, a person can be allowed to enter the hazardous area even though the machine is still powered. If the machine leaves the safe position while the person is still in the hazardous area, power is removed from the machine.



## Features

### Eden

#### Features

##### Easy PL e with Eden safety sensor

- Eden sensors can be connected in series while maintaining Cat. 4.
- Only one Eden per guard is necessary to reach PL e (instead of two key switches).
- Eden reaches PL e without any need for periodic checks (see ISO/TR 24119).

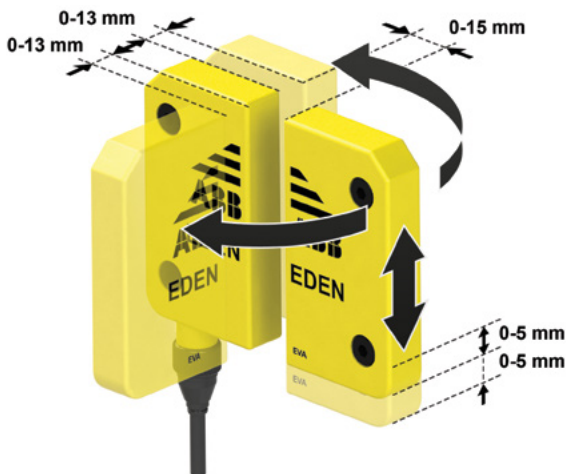


##### Low or high level coded sensor

Eva is available with General code or Unique code. If a new Adam is paired with an Eva general code at start up, Adam will accept all Eva with general code as a valid actuator. Eden will then classify as a low level coded sensor. If a new Adam is paired with an Eva Unique code at startup (or Eva AS-i), Adam will only accept this specific Eva as a valid actuator. In this case Eden is classified as a high level coded sensor. A high level coded sensor should be used when the motivation to defeat a sensor cannot be eliminated (see EN ISO 14119:2013).

##### 360° mounting possibility

Eden offers 360° mounting possibility with generous tolerances.



##### Local reset button

A local reset button with integrated LED can be connected directly to Adam Reset instead of to the safety control module. In this way, each Eden can easily have its own reset button, which saves cable length and safety relays/PLC inputs. Adam Reset monitors the reset function and manages the LED in the reset button in the following way:

- on** - Adam and Eva are not in contact
- flashing** - Adam and Eva in contact, waiting for reset
- off** - Adam and Eva in contact and reset

##### Info signal and extensive indication facilitate troubleshooting

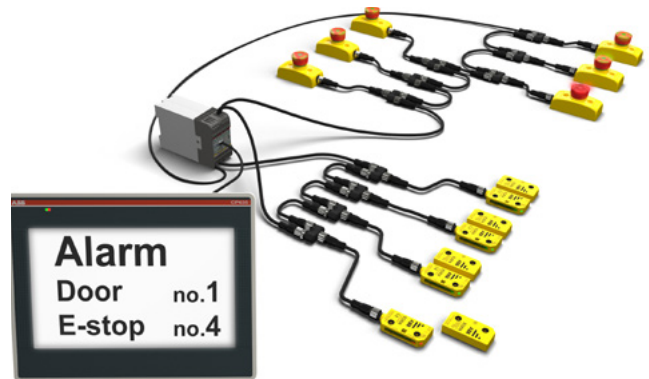
All Eden models offer extensive LED indication to help troubleshooting and localizing which doors/hatches are opened. The LED on Adam lights in green or red depending on status:

- green** - valid Eva within range
- red** - valid Eva out of range
- flashing red/green** - valid Eva within range, but no valid safety signal received (loop broken “upstream”)

The LED on Adam AS-i has slightly different default settings and can be programmed to light in any behaviour.

##### Simple status information with StatusBus

StatusBus is a simple and cost effective way to collect the status information of safety sensors. The StatusBus functionality is available with some DYNlink devices and allows to collect the status of each individual safety device, even when connected in series. A single input on Pluto safety PLC can collect the status of up to 30 safety devices. The devices are connected using standard cable and M12-5 connectors. No specific bus cable or extra communication module is necessary.





**Models**

Eden

Models

**Eden DYN**

Eden DYN consists of an Adam DYN and an Eva (general or unique code).

Adam DYN uses the ABB Jokab Safety DYNlink signal that allows to connect several safety products in series while maintaining PL e using only one channel. DYNlink signals must be used with Vital safety controller or Pluto safety PLC.

Up to 30 Adam DYN can be connected in series to Vital and up to 10 Adam DYN can be connected in series to one input of Pluto.

All products using the DYNlink signal can easily be connected in series and mixed in the same loop with a maintained PL e. Tina adapters allow to use other products in a DYNlink loop, and a wide range of connection accessories simplifies the cabling.



Eden DYN

**Eden AS-i**

Eden AS-i consists of an Adam AS-i and an Eva AS-i (Eva AS-i has a unique code).

Eden AS-i can be used with any AS-i monitor. AS-i is a bus system that offers a very simple connection of up to 31 safety devices to one monitor according to PL e and makes it easy to move, remove and add safety devices.

When Eden AS-i is used with Pluto programmable safety controller, no other AS-i master or monitor is necessary, and no specific knowledge of AS-i is required.



Eden AS-i

**Eden OSSD**

Eden OSSD consists of an Adam OSSD and an Eva (general or unique code).

Adam OSSD can be used with all safety relays and safety PLCs compatible with OSSD signals (commonly used for light guards). Up to 30 Adam OSSD can be connected in series, and since OSSD devices monitor their own outputs for short circuits, a Cat. 4/PL e can still be reached.



Eden OSSD

## Ordering information

### Eden



2TLC010045V0201

Adam DYN-Info M12-5

#### Adam

Type of safety controller	StatusBus	Info signal	Local reset	Series connection	Connector male	Type	Order code
Pluto	x	x <sup>1)</sup>		x	M12-5	Adam DYN-Status M12-5	2TLA020051R5200
Pluto or Vital		x		x	M12-5	Adam DYN-Info M12-5	2TLA020051R5100
			x	x	M12-5	Adam DYN-Reset M12-5	2TLA020051R5300
OSSD compatible (incl. Pluto and Sentry)		x			M12-5	Adam OSSD-Info M12-5	2TLA020051R5400
			x	x	M12-8	Adam OSSD-Info M12-8	2TLA020051R5700
				x	M12-5	Adam OSSD-Reset M12-5	2TLA020051R5600
			x	x	M12-8	Adam OSSD-Reset M12-8	2TLA020051R5900
AS-i safety monitor (incl. Pluto AS-i and B42 AS-i)	N/A <sup>2)</sup>	N/A <sup>2)</sup>		N/A <sup>2)</sup>	M12-4	Adam AS-i	2TLA020051R6000

1) Pin 5 can be used as a standard info signal or StatusBus.

2) AS-i offers the same advantages using another technology.

#### Eva

Compatible Adam	Code description	Code level	Type	Order code
Adam DYN and OSSD	General code. (Eva is interchangeable)	Low level	Eva General code	2TLA020046R0800
	Unique code. (Prevents defeat/fraud)	High level	Eva Unique code	2TLA020046R0900
Adam AS-i	Unique code. (Prevents defeat/fraud)	High level	Eva AS-i	2TLA020051R8000



2TLC0100061V0201

Eva General code

#### Accessories

Description	Type	Order code
Mounting plate for conventional door/hatch and folding door. Two pieces are needed for a complete set.	JSM D4H	2TLA040033R3600
Mounting plate for folding doors. Used together with one piece of JSM D4H.	JSM D4J	2TLA042020R4000
Sliding lock for Eden on conventional doors. (Eden is not included.)	JSM D20	2TLA020302R1000
Mounting converting plate from Eden E to Eden OSSD or Eden DYN	DA 3A	2TLA020053R0600
Heat shrinking tubes for M12 connectors. Protects M12 connectors in harsh environments and provides extra protection against tampering.	M12 Safety seal	2TLA020053R0800
Wrench for tightening of M12 connectors according to specified torque: 0.6 Nm.	M12 Torque wrench	2TLA020053R0900
Handheld terminal for addressing, configuration and testing of AS-i devices, StatusBus devices, DYNlink devices and conventional PNP devices.	FIXA	2TLA020072R2000



2TLC010040F0201

JSM D20 Eden slide lock



2TLC010040F0201

FIXA

#### Spare parts (included with main product on delivery)

Description	Type	Order code
Distance plate in yellow PBT (4 pcs).	DA 1B	2TLA020053R0700
Black distance rings to be mounted in Adam and Eva mounting holes (4 pcs).	DA 2B	2TLA020053R0300



2TLC12727F0201

Distance plate

#### Reset buttons for local reset

Description	Type	Order code
Reset button for Adam with 5 pins	Smile 12RF	2TLA030053R2600
Reset button for Adam with 8 pins	Smile 12RG	2TLA030053R2700



2TLC12757F0201

Smile 12RG Reset button

## Cables and connectors

### Eden



M12-C61

2TLC12951F0201



M12-C61HE

2TLC010009F0201



M12-C334

2TLC12931F0201

#### Cable with connectors

Connector	Female/male	Length	Special feature	Type	Order code
M12-5 *	Female	3 m		M12-C31	2TLA020056R0500
		6 m		M12-C61	2TLA020056R0000
		10 m	Harsh environment, halogen free	M12-C61HE	2TLA020056R8000
		20 m		M12-C101	2TLA020056R1000
			Harsh environment, halogen free	M12-C101HE	2TLA020056R8100
				M12-C201	2TLA020056R1400
	Female + male	0.3 m		M12-C0312	2TLA020056R5800
		0.06 m		M12-C00612	2TLA020056R6300
		1 m		M12-C112	2TLA020056R2000
		3 m		M12-C312	2TLA020056R2100
		6 m		M12-C612	2TLA020056R2200
		10 m		M12-C1012	2TLA020056R2300
			Angled female connector	M12-C1012V2	2TLA020056R6700
		16 m		M12-C1612	2TLA020056R5400
20 m			M12-C2012	2TLA020056R2400	
Male		6 m		M12-C62	2TLA020056R0200
	10 m		M12-C102	2TLA020056R1200	
M12-8	Female	6 m		M12-C63	2TLA020056R3000
		10 m		M12-C103	2TLA020056R4000
		20 m		M12-C203	2TLA020056R4100
	Female + male	0.06 m		M12-C00634	2TLA020056R6400
		1 m		M12-C134	2TLA020056R5000
		3 m		M12-C334	2TLA020056R5100

\* Compatible with Adam AS-i

#### Separate cables and connectors



M12-C01

2TLC12657F0201



C5 cable

2TLC010038F0201

Description	Type	Order code
<b>Connectors</b>		
M12-5 pole female, straight	M12-C01	2TLA020055R1000
M12-5 pole male, straight	M12-C02	2TLA020055R1100
M12-8 pole female, straight	M12-C03	2TLA020055R1600
M12-8 pole male, straight	M12-C04	2TLA020055R1700
<b>Cable with 5 conductors</b>		
10 m cable with 5 x 0.34 shielded conductors	C5 cable 10 m	2TLA020057R0001
50 m cable with 5 x 0.34 shielded conductors	C5 cable 50 m	2TLA020057R0005
100 m cable with 5 x 0.34 shielded conductors	C5 cable 100 m	2TLA020057R0010
200 m cable with 5 x 0.34 shielded conductors	C5 cable 200 m	2TLA020057R0020
500 m cable with 5 x 0.34 shielded conductors	C5 cable 500 m	2TLA020057R0050
<b>Cable with 8 conductors</b>		
50 m cable with 8 x 0.34 shielded conductors	C8 cable 50 m	2TLA020057R1005
100 m cable with 8 x 0.34 shielded conductors	C8 cable 100 m	2TLA020057R1010
200 m cable with 8 x 0.34 shielded conductors	C8 cable 200 m	2TLA020057R1020
500 m cable with 8 x 0.34 shielded conductors	C8 cable 500 m	2TLA020057R1050

## Connection Accessories

### Eden



2TLA02008P0201

**JSOP-2 Terminator**




#### Connection accessories

Description	Type	Order code
Y-connector for series connection of DYNlink devices with M12-5 connectors, e.g. Eden.	M12-3A	2TLA020055R0000
Y-connector for series connection of DYNlink devices with the StatusBus function.	M12-3S	2TLA020055R0600
Y-connector for series connection of Adam OSSD M12-8 with M12-8 cables	M12-3G	2TLA020055R0700
Y-connector for series connection of Adam OSSD M12-8 with M12-5 cables	M12-3H	2TLA020055R0800
Termination plug M12-5. For Adam OSSD with M12-3H. Connects pin 1 with pin 2 and 4.	JSOP-1 Terminator	2TLA020053R7000
Termination plug M12-8. For Adam OSSD with M12-3G. Connects pin 2 with pin 3 and 4.	JSOP-2 Terminator	2TLA020053R7100
M12-5 female connector with vampire connector for AS-i flat cable	AS-i T-connector M12	2TLA020073R0000

## Technical data

### Eden

#### Technical data

	Eden DYN	Eden OSSD	Eden AS-i
<b>Approvals</b>			
<b>Conformity</b>	<b>CE</b> 2006/42/EC - Machinery 2014/30/EU - EMC 2011/65/EU - RoHS  EN ISO 12100:2010, EN ISO 13849-1:2015, EN 62061:2005/A2:2015, EN 60204-1:2006+A1:2009, EN 60664-1:2007, EN 61000-6-2:2005, EN 61000-6-4:2007, EN 60947-5-3:2013, EN ISO 14119:2013, EN 61508:2010	EN ISO 12100:2010, EN ISO 13849-1:2015, EN 62061:2005/A2:2015, EN 60204-1:2006+A1:2009, EN 60664-1:2007, EN 61000-6-2:2005, EN 61000-6-4:2007, EN 60947-5-3:2013, EN ISO 14119:2013, EN 61508:2010	EN ISO 12100:2010, EN ISO 13849-1:2008, EN 62061:2005, EN 60204-1:2006+A1:2009, EN 60664-1:2007, EN 61000-6-4:2007
<b>Functional safety data</b>			
EN/IEC 61508:2010	SIL3, PFH <sub>D</sub> = 4.5 x 10 <sup>-9</sup>	SIL3, PFH <sub>D</sub> = 4.5 x 10 <sup>-9</sup>	SIL3, PFH <sub>D</sub> = 6.0 x 10 <sup>-10</sup>
EN/IEC 62061:2005+A1:2013	SILCL3, PFH <sub>D</sub> = 4.5 x 10 <sup>-9</sup>	SILCL3, PFH <sub>D</sub> = 4.5 x 10 <sup>-9</sup>	SILCL3, PFH <sub>D</sub> = 6.0 x 10 <sup>-10</sup>
EN ISO 13849-1:2008	PL e, Cat. 4, PFH <sub>D</sub> = 4.5 x 10 <sup>-9</sup>	PL e, Cat. 4, PFH <sub>D</sub> = 4.5 x 10 <sup>-9</sup>	PL e, Cat. 4, PFH <sub>D</sub> = 6.0 x 10 <sup>-10</sup>
<b>Electrical data</b>	+24 VDC Tolerance: +14.4...+27.6 VDC	+24 VDC Tolerance: +14.4...+27.6 VDC	+30 VDC (AS-i bus) Tolerance: +26.5...+31.6 VDC
<b>Mechanical data</b>			
Operating temperature	-40 °C...+70 °C (storage/operation)	-40 °C...+70 °C (storage/operation)	-40 °C...+85 °C (storage), -25 °C...+55 °C (operation)
Protection class	IP67 and IP69K		
Humidity range	35 to 85% (no icing, no condensation)		
<b>Material</b>			
Housing	Polybutylene terephthalate (PBT)		
Moulding	Epoxy		
Weight	Eva: 70 g, Adam: 80 g		
Assured release distance (S <sub>ar</sub> )	25 mm	25 mm	45 mm
Assured operating distance (S <sub>ao</sub> )	10 mm	10 mm	7.5 mm
Rated operating distance (S <sub>n</sub> )	15 ± 2mm		
Recommended distance between Adam and Eva	7 mm		
Min distance between two Eden	100 mm		

#### More information

For more information, e.g. the complete technical information, see product manual for:

Eden DYN [2TLC172271M0201](#)

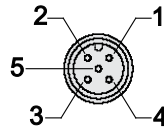
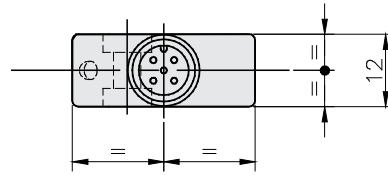
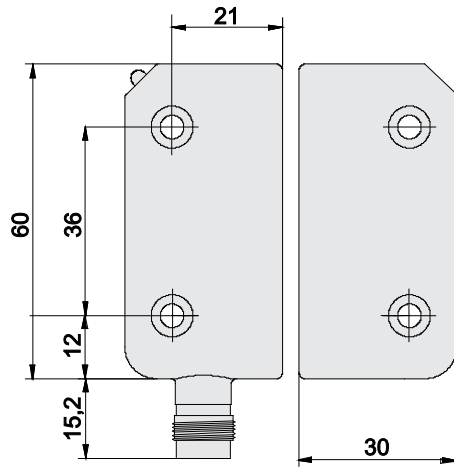
Eden OSSD [2TLC172272M0201](#)

Eden AS-i [2TLC172230M0201](#)

## Dimension drawings

Eden

### Dimension drawings



Adam M12-5 male connector.  
(Note that some models have 4 or 8 pins instead.)

All dimensions in mm



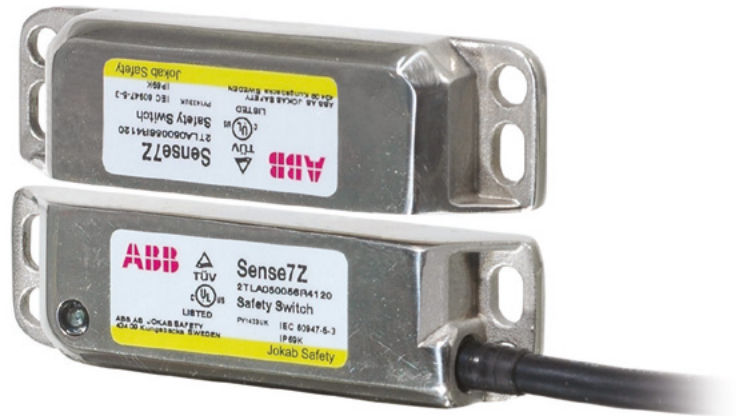
# Safety magnetic switch

## Sense7

Sense7 is a coded magnetic non-contact switch for interlocking gates and hatches.

Sense7 has a stainless steel housing that is designed for harsh environments and extreme temperatures.

Sense7 offers an interlocking function reaching PL e/SIL3 with low level coding.



### Safety and protection

#### High safety level

Sense7 has two closing and one opening solid state contacts. Two of these needs to be monitored to achieve PL e/SIL3.

#### LED indication

An integrated LED shows the status of the sensor.



### Easy to install

#### Compact size

Sense7 is compact in size to make it easy to position and hide on gates and hatches.

#### Large sensing distance

With a large sensing distance and a high tolerance for misalignment Sense7 is easy to install.



### Reliable in extreme conditions

#### Stainless steel

With a stainless steel 316 body and a IP67/IP69K rating, Sense7 is resistant to harsh environments with both dirt and water.

#### Hygienic design

Sense7 has no dust collecting cavities, and the stainless steel has a mirror polished finish (Ra4) suitable for CIP cleaning - food splash zones according to EHEDG guidelines.

#### High temperatures

Sense7 can be used at temperatures from -25 °C up to 105 °C.



## Ordering details

### Sense7



Sense7Z 2M



Sense7Z Key SS

#### Ordering details

Sense7 is always delivered with both switch and actuator.

Description	Connector	Cable length (m)	Contacts	Type	Order code
Safety magnetic switch	M12-8 male	0,25	2NC+1NO	Sense7Z M12	2TLA050056R2120
Safety magnetic switch	-	2	2NC+1NO	Sense7Z 2M	2TLA050056R4120
Safety magnetic switch	-	5	2NC+1NO	Sense7Z 5M	2TLA050056R5120
Safety magnetic switch	-	10	2NC+1NO	Sense7Z 10M	2TLA050056R6120

#### Spare part

Type of handle	Type	Order code
Actuator to safety magnetic switch Sense7Z, stainless steel.	Sense7Z Key SS	2TLA050040R0212

## Technical data

### Sense7

#### Technical data

##### Approvals



##### Conformity



2006/42/EC  
2014/30/EU  
2011/65/EU  
EN ISO 12100:2010, EN ISO 14119:2013, EN ISO 13849-1:2008+AC:2009, EN 60947-5-3:1999+A1:2005, EN 60947-5-2:1998+A1:1999+A2:2004

##### Functional safety data

<b>EN/IEC 61508:2010</b>	Up to SIL3 (depending on system architecture) PFH <sub>d</sub> = 2.52 x 10 <sup>-8</sup>
<b>EN/IEC 62061:2005+A1:2013</b>	Up to SILCL3 (depending on system architecture) PFH <sub>d</sub> = 2.52 x 10 <sup>-8</sup> Proof test interval T <sub>1</sub> = 47 a MTTF <sub>d</sub> = 470 a (8 cycles per hour/24 hours per day/365 days) B <sub>10d</sub> = 3 300 000 operations at 100 mA load
<b>EN ISO 13849-1:2008</b>	Up to PL e, Cat 4 (depending on system architecture) PFH <sub>d</sub> = 2.52 x 10 <sup>-8</sup>

If the product usage differs from these assumptions (different load, operating frequency, etc.) the values must be adjusted accordingly.

##### Electrical data

<b>Operating voltage</b>	+24 VDC ± 10%
<b>Minimum switched current</b>	10 VDC 1 mA
<b>Safety channel output (NC/NO)</b>	24 VDC 0.2 A max. rating

##### Mechanical data

<b>Material</b>	Stainless steel 316
<b>Protection class</b>	IP67 and IP69K
<b>Operating temperature</b>	-25 °C ... + 105 °C
<b>Cable type</b>	PVC 8 core 6 mm
<b>Mounting bolts (tightening torque)</b>	2 x M4 (1.0 Nm)
<b>Assured release distance (S<sub>ar</sub>)</b>	10 mm
<b>Assured operating distance (S<sub>or</sub>)</b>	20 mm
<b>Recommended distance</b>	5 mm

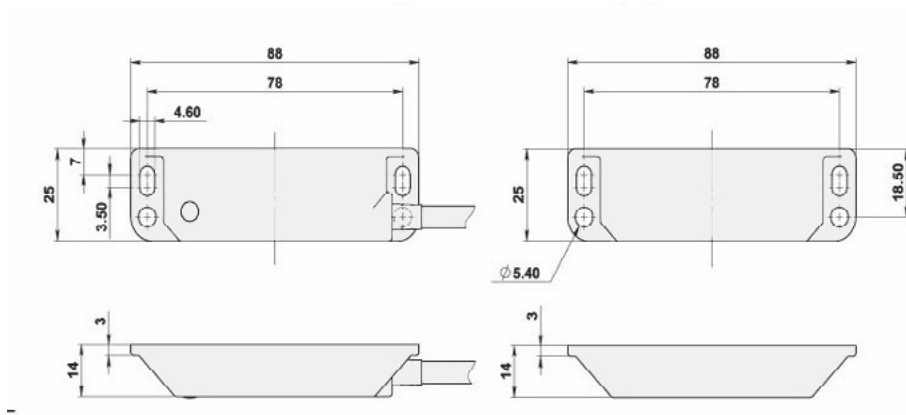
##### More information

For more information, e.g. the complete technical information, see product manual:  
Sense [2TLC172249M0201](#)

## Dimension drawings

### Sense7

#### Dimensions - Sense7Z



All dimensions in mm

# Safety interlock switch

## MKey

MKey are mechanical safety switches used for monitoring doors and hatches. The switch is mounted on the frame and the actuator key on the moving part of the guard.

All MKey models have a safe interlocking function. Some MKey models can be locked and depending on the locking signal they can be used either as process locks or safety locks (with a safe unlocking function).

MKey switches are available in different material and sizes in order to meet the requirements of different applications.



Safety and protection

### Highest level of safety

PL e/SIL3 can be reached when using two switches on a door.

### Safety lock

Models that use power to unlock can be used as safety locks.

### Emergency escape button

Using MKey8ER with an integrated emergency escape button, it is always possible to open the door from inside the dangerous zone.



Continuous operation

### Strong holding force

A holding force of up to 2000 N prevents unwanted process stops.

### Robust design

Models are available with full stainless steel housing with IP69K, suitable for most applications in food processing and chemical industries.

### Status information

Auxiliary contacts give status information.



Easy to install

### Easy mounting with rotating head

The head of the switch can be mounted in up to 8 actuating positions to allow different mounting positions.

### Flexible keys

Flexible keys are available to minimize mechanical wear and allow a smaller movement radius and use in reduced spaces.

## Applications

### MKey

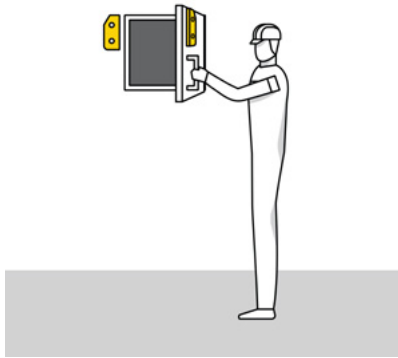
#### Doors and hatches

MKey is used to monitor the position of doors and hatches.

The models with locking function are usually used for:

- Processes which should not be interrupted, such as welding.
- Machinery with a long stopping procedure, such as paper machinery that requires a long braking operation.
- Prevention of unauthorized access to a particular area.

Please note that all safety key switches (including MKey) normally need two switches per door/hatch in order to reach PL e/SIL3. (See EN ISO 13849 and EN ISO 14119.)



#### Locking and interlocking

An interlocking function indicates if a door is open or closed and prevents movement when the door is open, but it does not prevent the door from being opened. A locking function makes sure the door is kept closed.

#### Process lock with safe interlocking

All MKey models offer a safe interlocking function that will stop the process if the door/hatch is opened. All lockable models of MKey can also be used as a process lock to prevent the process from being interrupted.

An example of an application where a process lock could be used is a welding robot where the stopping time is short, but the welding should not be interrupted once it has started.

#### Safety lock with safe interlocking and safe unlocking

The MKey models that uses power to unlock can be used as safety locks. They have a safe unlocking function, which means that the loss of power for these locks will not result in the release of the locking element, and the door will remain locked even during a power failure.

An example of an application where a safety lock should be used is a circular saw that would have a long stopping time after a power failure.

## Features

### MKey

#### Different models

MKey5 are simple mechanical interlocks while MKey8 and MKey9 also have locking functions.

- MKey5: plastic body with plastic or stainless steel head, or full stainless steel body and head. Holding force 12 N or 40 N.
- MKey8: robust design in die cast metal or stainless steel body and head. Holding force of 2000 N.
- MKey9: plastic body with stainless steel head. Holding force of 1800 N.

#### Different materials and protection classes

The housing and head of the key switches are available in different material in order to meet the requirements of different applications. Metal heads are more resistant to mechanical wear. The choice between plastic, die cast or stainless steel depends on the environment and the chemicals used. Models ending with -Z are completely made of stainless steel 316 and offers an IP69K protection class. They can be high pressure hosed with detergent at high temperature and can be used in harsh applications, e.g. the food processing and chemical industries. All other models offer IP67.

#### Emergency escape button

MKey8ER has a manual release button at the rear of the housing. It is used for emergency exit by a person locked inside the dangerous zone by mistake. It is a non-latching manual escape, and can be used when the risk assessment requires it. The switch must be mounted so that the release button is reachable from inside the dangerous zone, but not reachable from outside. Pressing and holding the button will release the locking mechanism allowing to open the door/guard.



#### Power to lock or power to unlock

Two different types of locking function are available:

- Spring lock (power to unlock) models are automatically locked when closing the door. An active signal (+24 VDC) must be supplied to unlock the switch, which makes these models suitable as safe locks.
- Electro-magnetic lock (power to lock) models are locked when an active signal (+24 VDC) is supplied, which makes these models suitable only as process locks.

#### Rotatable head

Depending on model, the head of MKey can be set in two or four directions with two entrance holes each, thus providing four or eight different mounting positions. The leading edges of the actuator key are reinforced and beveled in order to guide it properly into the hole.



#### Constructed for safety

All MKey switches have double positively operated forced-guided contacts controlled by the actuator key. This means that the contacts that are closed when the actuator key is in the switch will be forced to open, and the ones that are opened will be forced to close, when the actuator key is removed. It also means that it is not possible to have, e.g. NO and NC contacts opened at the same time due to a fault like one welded contact.

The actuator key is designed to prevent tampering with the safety switch using a tool, a magnet or any similar object. The lockable models also have forced-guided contacts controlled by the locking mechanism.

MKey8 and MKey9 have auxiliary contacts giving status information (not MKey5, MKey8M or MKey9M).

## Ordering information

### MKey



2TLC172403F0201

**MKey5**



2TLC172405F0201

**MKey5 SSH**



2TLC172503F0201

**MKey5Z**



2TLC172423F0201

**MKey9**



2TLC172417F0201

**MKey8ER**



2TLC172415F0201

**MKey8Z**

### MKey ordering information

Locking function	Material housing	Material head	Holding force	Special feature	Type	Order code
—	Plastic	Plastic	12 N		MKey5	2TLA050003R0100
			40 N		MKey5+	2TLA050003R0101
	Stainless steel	Stainless steel	12 N		MKey5 SSH	2TLA050003R0110
			40 N		MKey5+ SSH	2TLA050003R0111
	Stainless steel	Stainless steel	12 N	IP69K	MKey5Z	2TLA050003R0120
			40 N	IP69K	MKey5+Z	2TLA050003R0121
Process lock (power to lock)	Plastic	Stainless steel	1800 N		MKey9M 24VDC	2TLA050009R0112
	Die cast	Die cast	2000 N		MKey8M 24VDC	2TLA050013R0132
Safety lock (power to unlock)	Plastic	Stainless steel	1800 N		MKey9 24VDC	2TLA050007R0112
				No key supplied	MKey9 24VDC, No Key	2TLA050007R0012
	Die cast	Die cast	2000 N		MKey8 24VDC	2TLA050011R0132
				With escape release button	MKey8ER 24VDC	2TLA050015R0132
Stainless steel	Stainless steel	2000 N	IP69K	MKey8Z 24VDC	2TLA050011R0122	

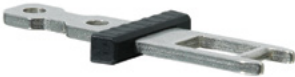
## Accessories

### MKey



MKey Key 2

2TLA050040R0201



MKey Key 3

2TLA050040R0201



MKey Key 4

2TLA050040R0201



MKey Key 6



MKey slide lock left



MKey slide lock right

#### Actuator keys

All MKey safety switches are supplied with the appropriate standard key, except MKey9 24VDC, No key. Choose standard key or flat key depending on suitable mounting direction, e.g. standard door or sliding door. Flexible keys are suitable for doors/hatches with a smaller opening radius (i.e. 100-175 mm).

Type of key	Compatible MKey models	Key housing	Description	Type	Order code
Standard key	MKey5 MKey5+	None	Standard key for MKey safety switches with plastic head. Stainless steel key.	MKey Key 1	2TLA050040R0201
	MKey5 SSH MKey5+ SSH MKey5Z MKey5+Z All MKey8 All MKey9	None	Standard key for MKey safety switches with metal head. Stainless steel key.	MKey Key 2	2TLA050040R0202
Flat key	All	Plastic shroud	Flat key for MKey safety switches. Stainless steel key with plastic shroud.	MKey Key 3	2TLA050040R0220
Flexible key	All MKey5	Plastic	Flexible key for MKey5 safety switches. Stainless steel key with plastic housing.	MKey Key 4	2TLA050040R0221
	All	Die cast	Flexible key for MKey safety switches. Stainless steel key with black die cast metal housing.	MKey Key 5	2TLA050040R0203
	All	Stainless steel	Flexible key for MKey safety switches. Stainless steel key with stainless steel housing.	MKey Key 6	2TLA050040R0204

#### Other accessories


Description	Type	Order code
Bit for manual unlocking of MKey8Z. Stainless steel.	MKey8Z Manual release	2TLA050040R0400
Maintenance lockout actuator key. Compatible with all MKey switches.	MKey Lockout key	2TLA050040R0401
Slide Lock for MKey8 and MKey9, left.	MKey slide lock left	2TLA050040R0500
Slide Lock for MKey8 and MKey9, right.	MKey slide lock right	2TLA050040R0501
Fitting in stainless steel for mounting MKey5 on a Quick-Guard conventional door.	JSM D29A	2TLA040033R6000
Fitting in stainless steel for mounting MKey5 on a Quick-Guard sliding door.	JSM D29B	2TLA040033R6100
Fitting in stainless steel for mounting MKey8 and MKey9 on a Quick-Guard conventional door.	JSM D29C	2TLA040033R6200
Fitting in stainless steel for mounting MKey8 and MKey9 on a Quick-Guard sliding door.	JSM D29D	2TLA040033R6300
Spacer in stainless steel for flexible keys. Required when using JSM D29A and JSM D29C.	JSM D29E	2TLA040033R6400



## Technical data

### MKey

#### Technical data

	MKey5	MKey8	MKey9
<b>Approvals</b>			
<b>Conformity</b>	<b>CE</b> 2006/42/EC - Machinery 2014/30/EU - EMC 2011/65/EU - RoHS EN ISO 12100:2010, EN ISO 14119:2013, EN 60204-1:2006:+A1:2009, EN 60947-1:2007:+A1:2011, EN 60947-5-1:2004:+A1:2009		
<b>Functional safety data</b>			
<b>B<sub>10d</sub></b>	2,500,000 operations at 100 mA load		
<b>EN/IEC 62061</b>	Up to SILCL3 (depending on system architecture) <sup>1)</sup>		
<b>EN ISO 13849-1</b>	Up to PL e (depending on system architecture) <sup>1)</sup>		
<b>Electrical data</b>			
<b>Contact block configuration with guard open and unlocked</b>			
<b>For actuator key</b>	2 NO + 1 NC	MKey8, MKey8Z, MKey8ER: 2 NO + 1 NC MKey8M: 1 NO + 1 NC	MKey9: 2 NO + 1 NC <sup>2)</sup> 1 NO + 1 NC
<b>For solenoid/locking</b>	-	MKey8, MKey8Z, MKey8ER: 2NO + 1NC MKey8M: 2 NO	MKey9: 2 NO + 1 NC <sup>2)</sup> MKey9M: 2 NO
<b>Solenoid voltage</b>	-	+24 VDC ± 10%	+24 VDC ± 10%
<b>DC-13</b>	+24 VDC / 3 A		
<b>AC-15</b>	230 VAC / 3 A		
<b>Mechanical data</b>			
<b>Travel for positive opening</b>	6 mm	10 mm	10 mm
<b>Actuator key entry minimum radius</b>	175 mm Standard Key, 100 mm Flexible Key		
<b>Material</b>	Body: Polyester or stainless steel 316 Head: Polyester or stainless steel 316	MKey8, MKey8M, MKey8ER: Die cast painted red MKey8Z: Stainless steel 316	Body: Glass filled polyester Head: Stainless steel 316
<b>Conduit entries</b>	3 x M20 x 1.5	3 x M20 x 1.5	1 x M20 x 1.5
<b>Operating temperature</b>	-25...+80 °C	-25...+40 °C	-25...+40 °C
<b>Protection class</b>	MKey5, MKey5+, MKey5 SSH, MKey5+ SSH: IP67 MKey5Z, MKey5+Z: IP67, IP69K	MKey8, MKey8M, MKey8ER: IP67 MKey8Z: IP67, IP69K	IP67

1) Please see EN/IEC 62061, EN ISO 13849, EN ISO 14119 and ISO/TR 24119 to see how fault exclusions and serial connection impacts the reliability of the safety related parts of control systems.

2) For MKey9, the pair of contacts for the actuator key and the pair of contacts for the locking cannot be used independently of each other. See the manual for more information.

#### More information

For more information, e.g. the complete technical information, see product manual:

MKey5 [2TLC172244M0201](#)

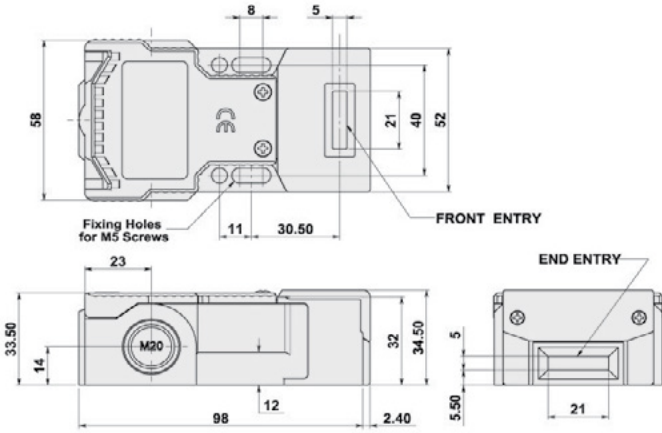
MKey8 [2TLC172245M0201](#)

MKey9 [2TLC172246M0201](#)

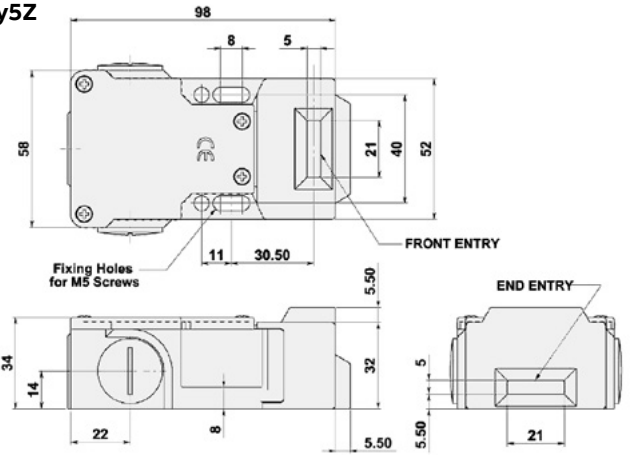
# Dimension drawings

## MKey

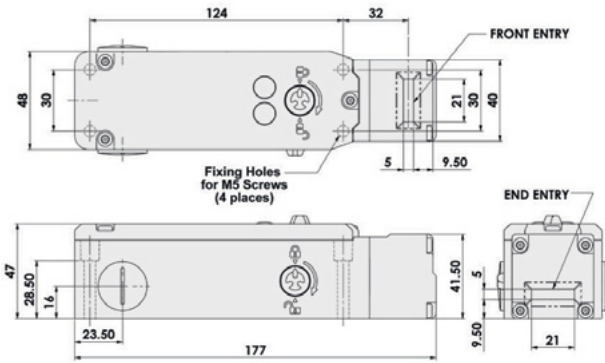
### MKey5



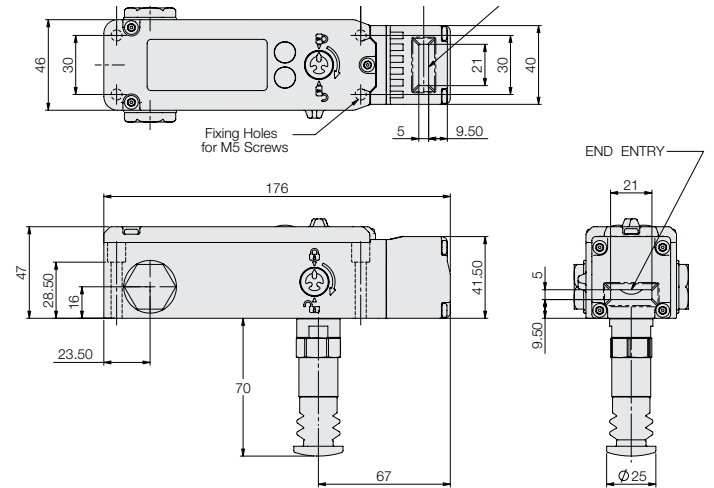
### MKey5Z



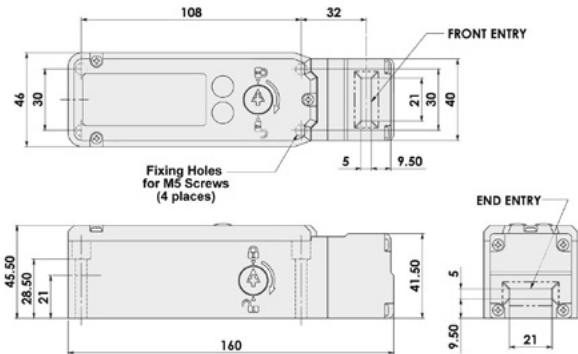
### MKey8 and MKey8M



### MKey8ER



### MKey9 and MKey9M



All dimensions in mm



# Electromagnetic process lock

## Magne

Magne is an electromagnetic process lock intended for locking doors and hatches.

Magne is usually used to prevent unwanted process interruptions, e.g. during a welding operation.

Magne models with integrated Adam safety sensor make it easy to achieve the highest safety level for the interlocking function.



Reliable in extreme conditions

### Sealed aluminium housing

IP67 sealing makes Magne suitable for humid environments.

### Robust design

The electromagnetic lock without mechanical moving parts is a robust design with fewer parts that are subject to wear.

### Hygienic design

Flat surfaces without cavities or screws sticking out minimize the risk of accumulating dirt on the surface.



Easy to install

### M12 connectors

Quick and easy cabling with M12 connectors.

### Magnets simplify installation

Electromagnets offer larger mounting tolerances than mechanical locks.



Continuous operation

### LED diagnostics

Integrated LED diagnostics reduce down time when troubleshooting.

### Strong holding force

A holding force of up to 1500 N prevents unwanted process stops.

## Applications and features

### Magne

#### Applications

##### Protect the process

Magne 4 is a process lock, with a safe interlocking function. This means that the interlocking function reaches PL e/SIL3 but the unlocking signal is not a safe signal. A typical application is to prevent unintentional/unnecessary interruptions of a sensitive process when the dangerous movement has a very short stop time.

Magne 3 is a simple lock without any interlocking function/safety function.



#### Features

##### PL e in a simple and cost effective way

Magne 4 has an integrated Adam sensor. Models are available with either Adam DYN or Adam OSSD. Eva General code or Eva Unique code is ordered separately. The use of the Eden safety sensor makes it easy to reach PL e/SIL3 for the interlocking function, and enables serial connection of several Magne 4 locks to the Pluto safety PLC using only one input for Eden DYN and two for Eden OSSD. Tina 12A can be used for the serial connection of two Magne 4 locks in order to simplify connection, reduce cabling and risk of connection errors.



##### Optional permanent magnet

Anchor plates for Magne are ordered separately and are available with or without permanent magnet. A permanent magnet holds the door closed when Magne is unlocked, or if there is a power loss. Without the permanent magnet, Magne has no magnetic field when unlocked, which avoids the accumulation of metallic particles on the magnet.

##### Good sealing

With a hygienic enclosure in anodized aluminum and IP67 protection class, Magne is well suited for humid environments.



##### M12 connectors

Since the Adam sensor is integrated in Magne 4, the amount of cables is reduced so that only one cable is necessary for both the locking of Magne and the interlocking with Eden. The M12 connectors speed up connection and reduce the risk of connection errors.



##### Status indication

Most models offer an info signal indicating whether the Magne is locked or not, which simplifies troubleshooting and improves user friendliness.

##### Locking and interlocking

An interlocking function indicates if a door is open or closed and prevents movement when the door is open. But it does not prevent the door from being opened. A locking function makes sure the door is kept closed.

# Ordering information

## Magne



Magne 3



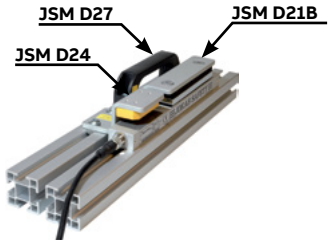
Magne 4



Anchorplate



JSM D28



JSM D23



Tina 12A

### Ordering details

For a complete Magne lock both door part and frame parts are necessary. Magne 4 also requires a separate Eva sensor.

Safe interlocking with integrated Adam	Safety signal	Extra function	Connector	Type	Order code
No	-	-	M12-5 male	Magne 3X M12-5	2TLA042022R2700
Yes	DYNlink	-	M12-5 male	Magne 4X DYN M12-5	2TLA042022R3000
		"Locked" and "Closed" information outputs	M12-8 male	Magne 4 DYN-Info	2TLA042022R3400
	OSSD	"Locked" and "Closed" information outputs	M12-8 male	Magne 4 OSSD-Info	2TLA042022R4600

### Accessories

Description	Type	Order code
Aluminium profile for door handle that completely covers a Magne unit when the door is closed. For conventional door (5-15 mm door gap)	JSM D28	2TLA042023R0100
Mounting kit for Magne. For conventional door (5 -15 mm door gap) *	JSM D21B	2TLA042023R0500
Mounting kit for Magne. For sliding door *	JSM D23	2TLA042023R0200
Mounting kit for Eva. For conventional door*	JSM D24	2TLA042023R0300
Door handle for JSM D21B	JSM D27	2TLA042023R1000
Connection block for serial connection of two Magne (M12-8)	Tina 12A	2TLA020054R1800
Cellular rubber, 10 mm thick. Spare part for anchor plate.	Cellular rubber	2TLA042023R3600

\* All mounting kits include the bolts and nuts necessary to mount Magne on ABB Quick-Guard® fencing system

### Door part

Description	Type	Order code
Anchor plate with permanent magnet. Delivered with cellular rubber.	Magne Anchor 32B	2TLA042023R0400
Anchor plate without permanent magnet. Delivered with cellular rubber.	Magne Anchor 32A	2TLA042023R1300

### Eva sensor for Magne 4 models

Compatible Adam	Code description	Code level	Type	Order code
Adam DYN and OSSD	General code. (Eva is interchangeable)	Low level	Eva General code	2TLA020046R0800
	Unique code. (Prevents defeat/fraud)	High level	Eva Unique code	2TLA020046R0900

## Cables and connectors

### Magne



M12-C61

2TLC172951F0201



M12-C61HE

2TLC010039F0201



M12-C334

2TLC172931F0201

#### Cable with connectors

Connector	Female/male	Length	Special feature	Type	Order code
M12-5	Female	3 m		M12-C31	2TLA020056R0500
		6 m		M12-C61	2TLA020056R0000
		10 m	Harsh environment, halogen free	M12-C61HE	2TLA020056R8000
		20 m	Harsh environment, halogen free	M12-C101	2TLA020056R1000
	Female + male	0.3 m		M12-C101HE	2TLA020056R8100
		0.06 m		M12-C201	2TLA020056R1400
		1 m		M12-C0312	2TLA020056R5800
		3 m		M12-C00612	2TLA020056R6300
		6 m		M12-C112	2TLA020056R2000
		10 m		M12-C312	2TLA020056R2100
		16 m		M12-C612	2TLA020056R2200
		20 m		M12-C1012	2TLA020056R2300
			Angled female connector	M12-C1012V2	2TLA020056R6700
				M12-C1612	2TLA020056R5400
Male	6 m		M12-C2012	2TLA020056R2400	
	10 m		M12-C62	2TLA020056R0200	
M12-8	Female	6 m		M12-C102	2TLA020056R1200
		10 m		M12-C63	2TLA020056R3000
		20 m		M12-C103	2TLA020056R4000
	Female + male	0.06 m		M12-C203	2TLA020056R4100
		1 m		M12-C00634	2TLA020056R6400
		3 m		M12-C134	2TLA020056R5000
				M12-C334	2TLA020056R5100

#### Separate cables and connectors



M12-C01

2TLC172657F0201



C5 cable



2TLC010039F0201

Description	Type	Order code
<b>Connectors</b>		
M12-5 pole female, straight	M12-C01	2TLA020055R1000
M12-5 pole male, straight	M12-C02	2TLA020055R1100
M12-8 pole female, straight	M12-C03	2TLA020055R1600
M12-8 pole male, straight	M12-C04	2TLA020055R1700
<b>Cable with 5 conductors</b>		
10 m cable with 5 x 0.34 shielded conductors	C5 cable 10 m	2TLA020057R0001
50 m cable with 5 x 0.34 shielded conductors	C5 cable 50 m	2TLA020057R0005
100 m cable with 5 x 0.34 shielded conductors	C5 cable 100 m	2TLA020057R0010
200 m cable with 5 x 0.34 shielded conductors	C5 cable 200 m	2TLA020057R0020
500 m cable with 5 x 0.34 shielded conductors	C5 cable 500 m	2TLA020057R0050
<b>Cable with 8 conductors</b>		
50 m cable with 8 x 0.34 shielded conductors	C8 cable 50 m	2TLA020057R1005
100 m cable with 8 x 0.34 shielded conductors	C8 cable 100 m	2TLA020057R1010
200 m cable with 8 x 0.34 shielded conductors	C8 cable 200 m	2TLA020057R1020
500 m cable with 8 x 0.34 shielded conductors	C8 cable 500 m	2TLA020057R1050

## Technical data

### Magne

#### Technical data

	Magne 3	Magne 4
Approvals		
Conformity	<b>CE</b> 2014/35/EU - Low voltage 2011/65/EU - RoHS EN 60204-1:2006+A1:2009, EN 60664-1:2007, EN 61000-6-2:2005, EN 61000-6-4:2007+A1:2011	<b>CE</b> 2006/42/EC - Machinery 2014/30/EU - EMC 2011/65/EU - RoHS EN ISO 12100:2010, EN ISO 13849-1:2015, EN 62061:2005/A2:2015, EN 60204-1:2006+A1:2009, EN 60664-1:2007, EN 61000-6-2:2005, EN 61000-6-4:2007+A1:2011, EN 60947-5-3:2013, EN ISO 14119:2013, EN 61508:2010
<b>Functional safety data</b>		
EN 61508:2010		Interlocking function: SIL3, PFH <sub>b</sub> = 4.50 x 10 <sup>-9</sup>
EN 62061:2005		Interlocking function: SILCL3, PFH <sub>b</sub> = 4.50 x 10 <sup>-9</sup>
EN ISO 13849-1:2008		Interlocking function: PL e, Cat. 4, PFH <sub>b</sub> = 4.50 x 10 <sup>-9</sup>
<b>Electrical data</b>		
Operating voltage	+24 VDC ± 15%	
<b>Holding force</b>		
+24 VDC	Min 1500 N	
0 V, Anchor plate 32A	0 N	
0 V, Anchor plate 32B	30 N	
<b>Mechanical data</b>		
Mechanical life	>10 <sup>7</sup> switch operations	
Operating temperature	-20...+50 °C	
Humidity range	35 to 85% (with no icing or condensation)	
Protection class	IP67	
<b>Weight</b>		
	610 g	700 g
Anchor plate 32A/B	290 g	
<b>Material</b>		
Anchor plate	Iron with nickel coating	
Electromagnet	Iron with zinc-nickel coating	
Housing	Anodized aluminum with parts in polycarbonate	
Potting	PUR, epoxy	

#### More information

For more information, e.g. the complete technical information, see product manual for:

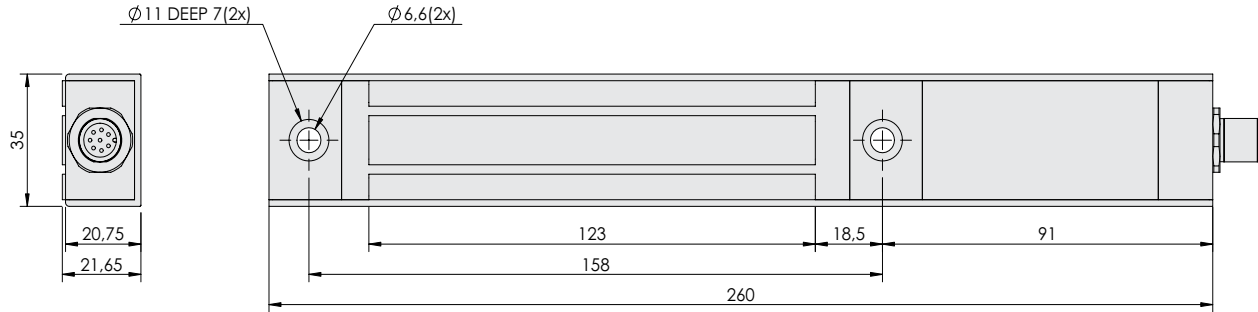
Magne [2TLC172315M0201](#)



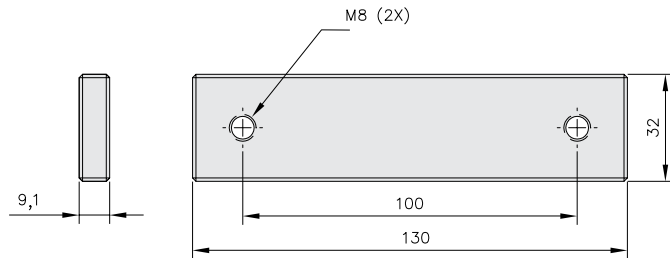
## Dimension drawings

### Magne

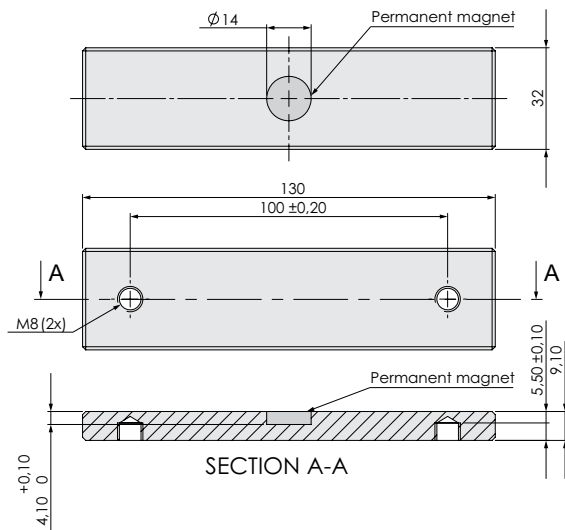
#### Magne



#### Anchor plate 32A



#### Anchor plate 32B



All dimensions in mm

# Safety lock

## GKey

**GKey is a robust safety lock with a die cast housing for hinged and sliding doors.**

**GKey offers an interlocking function reaching PL e/SIL 3 with high level coding. Power is needed to unlock GKey which makes GKey a safety lock.**

**GKey is fitted with a rear escape release button and manual unlocking (auxiliary release).**

**GKey offers four positions for 22 mm pilot devices.**



Safety and protection

### Escape release

The door can always be opened from inside the danger zone using the escape release button.

### High level coding

A standard mechanical interlock combined with RFID coding offers high level coding.

### Lockout function

GKey can be padlocked off for safe working.



Easy to install

### Integrated buttons

There are four positions in the key housing that can be used for integrating push buttons, switches or pilot lights.



Reliable in extreme conditions

### Robust design

Made of die cast aluminum alloy with a robust construction, GKey is ideal for use in mechanically demanding environments.

## Ordering details

### GKey



GKey4 RU



FHS GKey4



RHS GKey MKey



SCS GKey MKey



CE3P-10R-02



C2SS1-10B-20



CP1-11C-10



MA1-8130



KA1-8120

#### Ordering Details

For a complete safety lock, a switch and a mounting plate with front handle must be ordered separately. Rear handle, spring catch, pilot devices and blanking plugs for the unused positions are available and also ordered separately.

#### Switches

All models are fitted with an escape release button and delivered with a high level coded RFID actuator.

Material (body)	Positions for pilot devices	Manual unlock	Type	Order code
Die cast	4	Yes	GKey4 RU	2TLA050304R0002

#### Mounting plate with front handle

The handle can be mounted on hinged doors and sliding doors, on the left or on the right. Note that door and frame must be aligned when the door is closed. Each order code includes a mounting plate for the switch and a front handle.

Type of handle	Material (mounting plates and sliding bolt)	Type	Order code
Sliding	Die cast	FHS GKey4	2TLA050310R0032

#### Accessories - Rear handle and spring loaded catch

The spring loaded catch prevents from closing the door by mistake. When the sliding handle is in open position, the catch must be pulled in order to be able to push back the handle to closed position.

Type of handle	Material	Description	Type	Order code
Sliding	Die cast	Rear handle	RHS GKey MKey	2TLA050040R0510
		Spring catch	SCS GKey MKey	2TLA050040R0511

#### Accessories - Pilot devices

Pilot devices and blanking plugs must be ordered separately. Make sure that the total amount is 4, so that all holes in GKey4 are covered.

Description	Contacts	Illuminated	Voltage	Type	Order code
Emergency stop button	2NC	No	24 V AC/DC	CE3P-10R-02	1SFA619501R1051
Selector switch	2NO	No	24 V AC/DC	C2SS1-10B-20	1SFA619200R1026
Push button Green	1NO	Yes	24 V AC/DC	CP1-11G-10	1SFA619100R1112
Push button Yellow	1NO	Yes	24 V AC/DC	CP1-11Y-10	1SFA619100R1113
Push button Blue	1NO	Yes	24 V AC/DC	CP1-11L-10	1SFA619100R1114
Push button White/Clear	1NO	Yes	24 V AC/DC	CP1-11C-10	1SFA619100R1118
Push button Black	1NO	No	24 V AC/DC	CP2-10B-10	1SFA619101R1016
Blanking plug Black				MA1-8130	1SFA611920R8130
Legend plate holder (without insert)				KA1-8120	1SFA616920R8120

## Technical data

### GKey

#### Technical data

##### Approvals



##### Conformity



2006/42/EC – Machinery  
 2014/53/EU – RED  
 2011/65/EU – RoHS2  
 2015/863 – RoHS3  
 EN ISO 12100:2010, EN ISO 14119:2013, EN ISO 13849-1:2015, IEC 62061:2005+A2:2015, IEC 60947-5-3:2013, IEC 60947-1:2014, EN 60204-1:2018, EN 301 489-1 V2.1.1, EN 301 489-3 V1.6.1

##### Functional safety data

###### EN 62061:2005+A1:2013

SIL3  
 PFH =  $4.77 \times 10^{-10}$  (corresponds to 4.8% of SIL3),  
 PFD =  $4.18 \times 10^{-5}$  (corresponds to 4.2% of SIL3)  
 Proof test interval  $T_1 = 20$  a

###### EN ISO 13849-1:2008

PL e (if both channels are used in conjunction with a SIL3/PL e control device),  
 Category 4,  $MTTF_d = 1100$  a, DC high

###### Assumptions

$d_{op} = 365d$ ,  $h_{op} = 24h$

If the product usage differs from these assumptions (different load, operating frequency, etc.) the values must be adjusted accordingly.

##### Electrical data

Operating voltage +24 VDC  $\pm 10\%$

Holding force 3000 N

##### Mechanical data

Connection M20 (x3)

Operating temperature  $-25^\circ\text{C} \dots +40^\circ\text{C}$

Protection class IP65.

##### More information

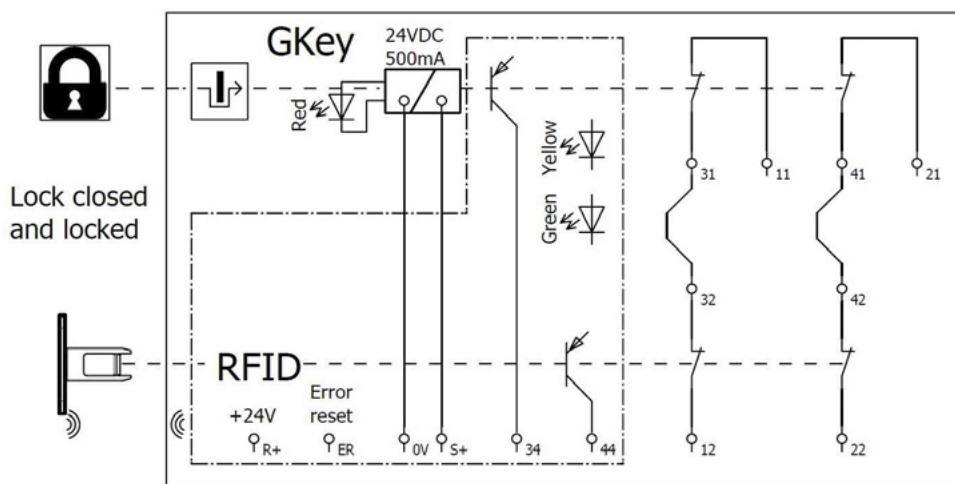
For more information, e.g. the complete technical information, see product manual:

GKey [2TLC010048M0201](https://library.abb.com/)

##### Connection diagrams

For GKey connection diagrams please see <https://library.abb.com/>

##### Electrical connection

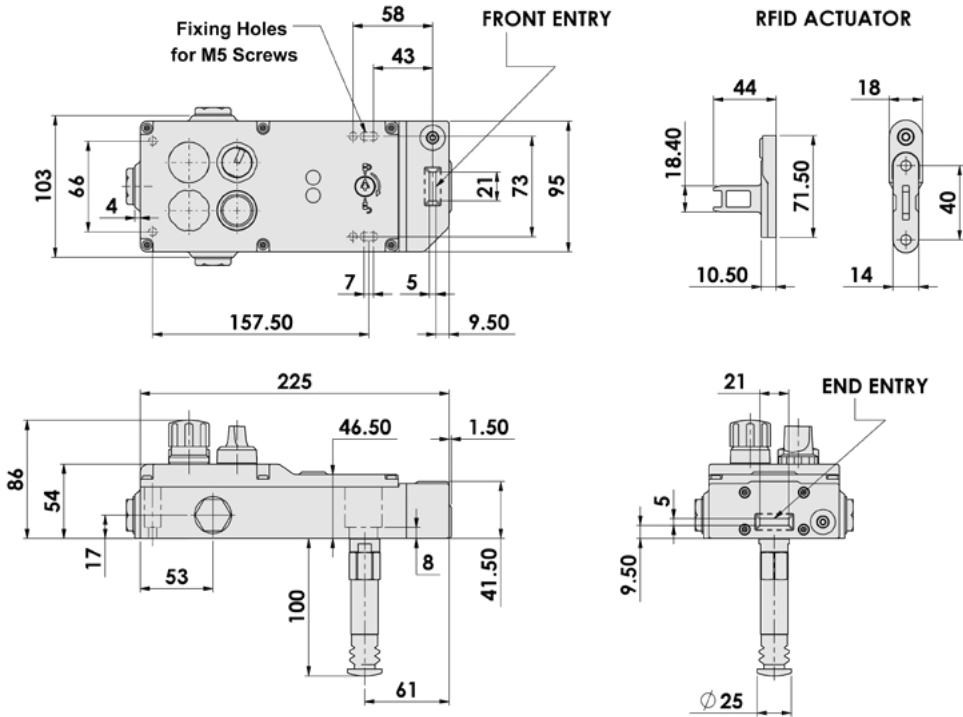


Actuator must be in place and RFID coding verified for the safety contacts to close.

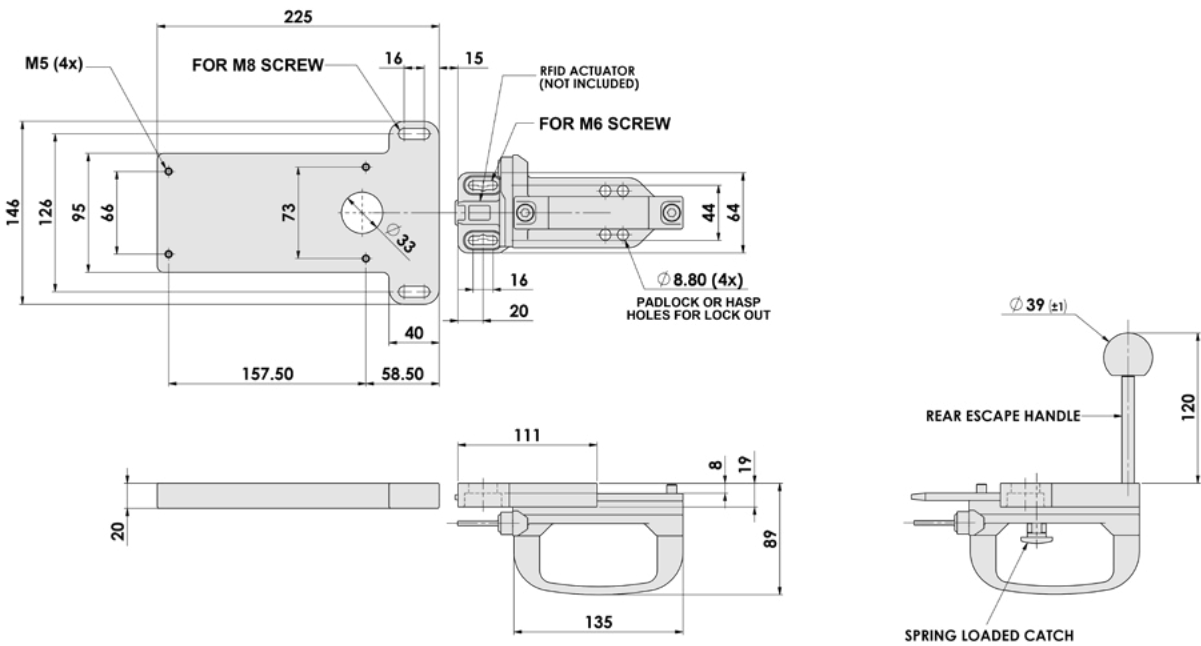
## Dimension drawings

### GKey

#### Dimensions - GKey4 switch and actuator



#### Dimensions - FHS GKey4 with rear handle and spring loaded catch



All dimensions in mm

