

# Magne 3 and 4 Electromagnetic process lock

Complete Product Manual [EN]

found at:  
[abb.com/lowvoltage](http://abb.com/lowvoltage)



## Product description

Magne is an electromagnetic process lock that locks a door or a hatch and is intended for applications that are sensitive to unwanted or unnecessary interruptions. Magne has a holding force of up to 1500 N.

Magne can be installed on a door, preferably using an ABB mounting kit, available for sliding doors or hinged (conventional) doors.

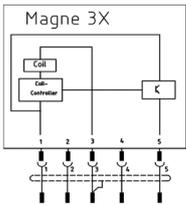
Magne 3 keeps a door locked. If used in safety applications, Magne 3 needs to be complemented with an external interlocking device.

Magne 4 has an integrated Adam sensor which provides an interlocking function together with an Eva actuator. The Eva actuator is ordered and installed separately.

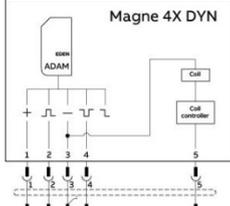
Magne 4 is available with integrated Adam DYN (DYNlink signal) or Adam OSSD (OSSD signal) using M12 5-pole or M12 8-pole connector.

Anchor plates are delivered with a cellular rubber. Anchor plate 32E has an integrated permanent magnet. Anchor plate 32D is without a magnet. Y-connectors and other accessories are available to facilitate connection in series.

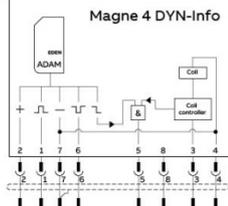
## Connections



- M12 5-pole connector**
- 1) Brown: Locking signal +24 VDC
  - 2) White: Not used
  - 3) Blue: 0 V
  - 4) Black: Not used
  - 5) Grey: Info output, locked



- M12 5-pole connector**
- 1) Brown: +24 VDC
  - 2) White: DYNlink signal in
  - 3) Blue: 0 V
  - 4) Black: DYNlink signal out
  - 5) Grey: Locking signal +24 VDC



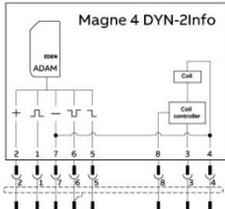
- M12 8-pole connector**
- 1) White: DYNlink signal in
  - 2) Brown: +24 VDC
  - 3) Green: Locking signal +24 VDC
  - 4) Yellow: 0 V
  - 5) Grey: Info output (Adam and Eva closed & Magne locked)
  - 6) Pink: DYNlink signal out
  - 7) Blue: 0 V
  - 8) Red: Not used

**Warning!** Always use shielded cables to connect the unit to the rest of the safety circuit.

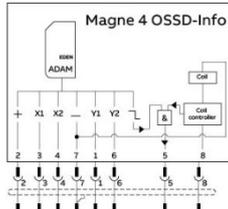
**Warning!** The info output is non-failsafe and shall **never** be used to control a safety application.

**Warning!** The DYNlink signal or OSSD signals are used to control the safety application.

**Note!** Several Magne 3X units can be connected using a M12-3A Y-connector or several Magne 4 OSSD-Info using a M12-3G Y-connector, but the info-signal will not be available. Several Magne 4X DYN units can be connected using a M12-3S Y-connector.



- M12 8-pole connector**
- 1) White: DYNlink signal in
  - 2) Brown: +24 VDC
  - 3) Green: Locking signal +24 VDC
  - 4) Yellow: 0 V
  - 5) Grey: Info output (Adam and Eva closed)
  - 6) Pink: DYNlink signal out
  - 7) Blue: 0 V
  - 8) Red: Info output (Locked)



- M12 8-pole connector**
- 1) White: OSSD1 out
  - 2) Brown: +24 VDC
  - 3) Green: OSSD1 in
  - 4) Yellow: OSSD2 in
  - 5) Grey: Info output (Adam and Eva closed & Magne locked)
  - 6) Pink: OSSD2 out
  - 7) Blue: 0 V
  - 8) Red: Locking signal +24 VDC

## Safety precautions

**Warning!** Carefully read through the entire product manual before using the device.

**Warning!** The devices shall be installed by authorized personnel following the Safety regulations, standards and the Machinery directive.

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

## Installation

Installation shall be done in accordance with a risk assessment for the individual application.

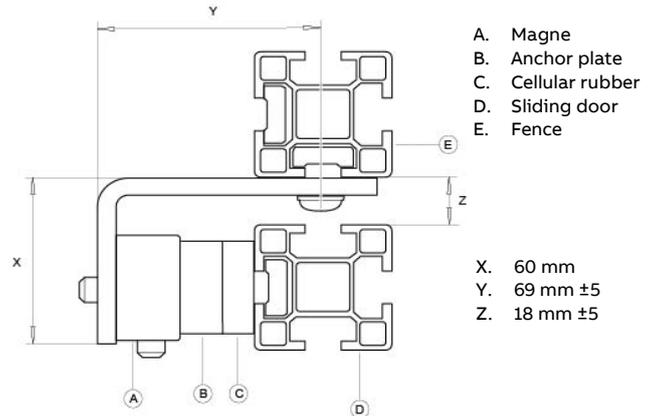
**Warning!** All safety functions shall be tested before starting up the system.

**Warning!** Do not defeat, tamper or bypass the safety function. Failure can result in death or serious injury.

**Warning!** The M12 connector shall be connected after Magne has been installed on the intended surface.

**Caution!** Magne shall be installed as close to the door handle as possible. The distance between the lock and the handle creates a lever effect, reducing the holding force.

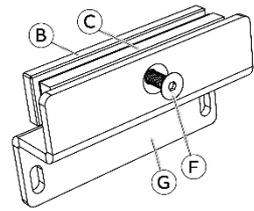
1. Install Magne and accessories as close to the door handle as possible. Use relevant mounting kit and follow the installation guide included in the kit. Installation tolerances for Magne 3 and JSM D23C on a sliding door:



- A. Magne
- B. Anchor plate
- C. Cellular rubber
- D. Sliding door
- E. Fence

- X. 60 mm
- Y. 69 mm ±5
- Z. 18 mm ±5

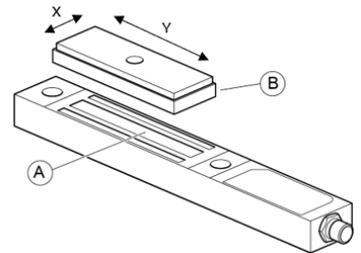
2. Anchor plate (B) is installed with cellular rubber (C) between the anchor plate and the bracket (G) mounted on the door. The cellular rubber is attached to the anchor plate with adhesive tape and enables the anchor plate to adjust to Magne. Use suitable M8 screw (F). Recommended tightening torque is 7 Nm ±2.



**Note!** Do not compress the cellular rubber to a thickness less than 8 mm. Do not overtighten the screw. This can deform the anchor plate, causing reduced or no holding force.

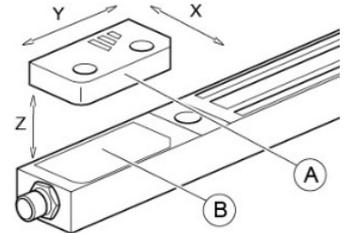
Make sure the surfaces of the electromagnet (A) and the anchor plate (B) are completely parallel, i.e. that full contact is obtained when the door is closed.

- Installation tolerances:
- X. ±3 mm sideways
  - Y. ±5 mm lengthways



3. The safety functionality of Magne 4 is based on the integrated Adam sensor and the Eva actuator. Eva unit (A) must be correctly positioned above the yellow cover on Magne/Adam (B) when the door is closed.

- Positioning tolerances:
- X. ±5 mm sideways
  - Y. ±5 mm lengthways
  - Z. 2-7 mm



**Note!** For the sensor to work as intended it is very important that the units are correctly positioned and that the safety functions are tested.

4. Connect the pin out according to chapter 'Connections'.
5. Connect the M12 connector to Magne.
  - Note!** Make sure no power supply is connected when cable is fitted to the Magne M12 pin out.
6. Close the door to put Eva within sensing distance of Adam.
7. Connect Magne to the power supply and turn power on.
  - Note!** Only connect Magne to power supply when Eva is within sensing distance. The integrated Adam sensor in Magne 4 needs to learn the Eva code. For Magne 3 the blue LED will illuminate with a solid light when connected. For Magne 4 the green LED will illuminate with a solid light. The blue LED will illuminate with a solid light when the locking signal is activated.
8. After installation, check the locking function.

**Caution!** After installation, check the locking function and that the surfaces of the magnet and the anchor plate are parallel, i.e. that full contact is obtained when the door is closed. If the anchor plate tilts, the holding force of the lock can be significantly reduced or eliminated.

## Maintenance

**⚠ Warning!** The safety functions and the mechanics shall be tested regularly. Check correct operation of all circuits and the locking function at least once a year.

**⚠ Warning!** A defective unit shall be replaced with a new unit. **Never** bypass the safety circuit.

**⚠ Warning!** In case of breakdown or damage to the product, contact nearest ABB Electrification Sweden service office or reseller. Do not try to repair the product yourself.

**⚠ Warning!** ABB will not accept responsibility for failure of the switch functions if the installation and maintenance requirements shown in this document are not implemented.

**⚠ Caution!** The electromagnet shall be regularly cleaned to maintain its full holding force. Dirt or dust on the anchor plate or Magne can cause low or no holding force.

Instructions regarding 'Testing safety function' and 'Replacing Eva unit' can be found in the complete 'Magne 3 and 4 Product Manual' available on web.

## LED indications

Model	LED Indication	Description	Safety circuit
Magne 3 + Magne 4	Blue	Magne is locked	N/A
Magne 3 + Magne 4	Blue flashing	Lock signal, but Magne is not detecting the anchor plate	N/A
Magne 4	Green	Eva within sensing distance of Adam (door closed)	Closed
Magne 4	Green flashing	Eva within 2 mm from maximum sensing distance (door closed)	Closed
Magne 4	Green-Red flashing	Eva within sensing distance, safety circuit before this unit broken (door closed)	Open
Magne 4	Red	Eva out of sensing distance (door open)	Open
Magne 4	Red flashing	Eva code not stored in Adam	Open
Magne 4	Red fast flashing	Fail safe mode	Open
Magne 4 (OSSD)	Red-Red-Green fast flashing	Invalid input signal	Open

## Troubleshooting

LED Indication	Probable cause	Action
No LED light	No voltage	Check +24 VDC power supply.
Blue flashing	Anchor plate is missing or not centered	Check anchor plate position.
<b>Magne 4:</b>		
Green flashing	Eva within 2 mm from maximum sensing distance	Adjust Eva position.
Red solid light	Eva out of sensing distance, safety circuit broken (door open)	Move Eva within sensing distance of Adam (close door).
	Metal between Adam and Eva	Remove metal.
Green and Red at the same time	Unit is defective	Replace the unit.
Green-Red fast flashing	Valid Eva code missing	Perform procedure to replace Eva. If fault indication remains, the unit is defective and must be replaced.
Red fast flashing	Fail safe mode	Power cycle (i.e. turn off power, wait for one minute and turn it on again).
Green-Red flashing	Input signal is missing	1. Check output signal from the previous unit in the signal chain. 2. Turn off power supply. 3. Move Eva within sensing distance of Adam. 4. Power supply.
Red-Red-Green fast flashing (OSSD only)	Invalid input signal	Power cycle (i.e. turn off the power, wait for one minute and turn it on again). If fault indication remains, check incoming signals.

## Technical data

Manufacturer	
Address	ABB Electrification Sweden AB SE-721 61 Västerås Sweden
Mechanical data	
Anchor plate material	Iron with nickel coating
Electromagnet material	Iron with zink coating
Housing material	Anodized aluminum and polycarbonate
Potting material	PUR, epoxy
PCB coating material	SEPUR 540RT
Enclosure protection	IP67
Ambient temperature	Operating temperature: -20 °C to +50 °C Storage temperature: -20 °C to +70 °C
Holding force	Up to 1500 N (on correct installation) Anchor plate permanent magnet 32E holding force: 30 N
Humidity	35-85 % (without ice formation or condensation)
Weight	Magne 3, Magne 4: 700 g Anchor plate 32D/32E: 290 g
Electrical data	
Operating voltage	Electromagnet +24 VDC ±15 %

Current consumption	<b>+24 VDC:</b> Magne 3: 10 mA, Magne 4: 50 mA Note! Any current drawn on outputs (e.g. the information output) will be an additional input current on +24 VDC. <b>Locking signal:</b> Nominal: 250 mA at 24 VDC, max. 350 mA at 27.6 VDC
Information output	Max. 20 mA
Cable dimension	Cable dimensioning should be checked when connecting several units in series. Standard cables from ABB have a cross sectional area of 0.34 mm <sup>2</sup> . Magne does not cause any power surge when locking is activated.
Connector	M12 5-pole male connector (Magne 3X, Magne 4X DYN) M12 8-pole male connector (Magne 4 DYN-Info, Magne 4 DYN-2Info and Magne 4 OSSD-Info)
Safety / Harmonized standards	
Conformity	European Machinery Directive 2006/42/EC EMC directive 2014/30/EU RoHS directive 2011/65/EU RoHS3 directive 2015/863
Application standard compliance	EN ISO 14119:2013
Functional safety standard compliance	EN ISO 12100:2010 EN ISO 13849-1:2015, PL e/Category 4, PFH <sub>b</sub> = 4.50·10 <sup>-9</sup> EN ISO 13849-2:2012 EN 62061:2005+A1:2012+A2:2015, SIL3, PFH <sub>b</sub> = 4.50·10 <sup>-9</sup> EN 61508:2010, SIL3, PFH <sub>b</sub> = 4.50·10 <sup>-9</sup>
<b>⚠ Warning!</b>	The safety related values are based on interlocking device Eden and are not valid for the locking function.
Electrical safety standard compliance	EN 60204-1:2006 + A1:2009 EN 60664-1:2007
Electromagnetic compatibility standard compliance	EN 60947-5-2:2007+A1:2012 EN 60947-5-3:2013
Certifications	cULus, TÜV Süd
Information for use in USA/Canada (UL)	
Enclosure	Type 1
Intended usage	Applications according to NFPA 79
Connecting cables	Cables to comply with CYJV/7, with a conductor area of min. 0.2 mm <sup>2</sup> .
Power source	The Limited Voltage / Current source must comply with one of the following: A) An isolating device such that the maximum open circuit voltage potential available to the circuit is not more than 30 VDC and the current is limited to a value not exceeding 8 amperes measured after one minute of operation. B) A suitable isolating source in conjunction with a fuse in accordance with UL248. The fuse shall be rated max. 3 A and be installed in the 30 VDC power supply to the device in order to limit the available current.
Conductor area	Max. current limit for overload protection: AWG (mm <sup>2</sup> ) Amps 24 (0,20)2 22 (0,32)3 20 (0,52)5 18 (0,82)7

Further information regarding the interlock switch can be found in 'Eden Product Manual' available on web.

Descriptions and examples show how the product works and can be used. It does not mean that it fulfills the requirements for all types of machines and processes. The buyer/user is responsible for installing and using the product according to applicable standards and regulations. We reserve the right to make changes to the product and the documentation without prior notice.

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