

## Scope

These operating instructions are valid for all CMS-AS1... These operating instructions, the document *Safety information* and any available data sheet form the complete user information for your device.

### Important!

Make sure to use the operating instructions valid for your product version. The version numbers can be found on the type label of your product. Please contact the EUCHNER service team if you have any questions.

## Safety switch type label



① Item designation

## Supplementary documents

The overall documentation for this device consists of the following documents:

| Document title<br>(document number)         | Contents   |  |
|---|--|--|
| Safety information<br>(2525460)             | Basic safety information   |  |
| Operating instructions<br>(2105099)         | (this document)  |  |
| Declaration of conformity                   | Declaration of conformity  |  |
| Any additions to the operating instructions | Take any associated additions to the operating instructions or data sheets into account. |  |

### Important!

Always read all documents to gain a complete overview of safe installation, setup and use of the device. The documents can be downloaded from [www.euchner.com](http://www.euchner.com). For this purpose, enter the doc. no. or the order number for the device in the search box.

## Correct use

The Coded Magnetic Safety switches of series CMS...AS1 from EUCHNER are operated as slaves on the safety bus AS-Interface Safety at Work and function as safety devices for monitoring movable guards.

The system consists of read head and actuator. It forms a non-contact, magnetically coded interlocking device with low coding level (type 4).

In combination with a guard, this system prevents dangerous machine functions from being performed for as long as the guard is opened. A stop command is triggered if the guard is opened during the dangerous machine function.

Before safety components are used, a risk assessment must be performed on the machine, e.g. in accordance with:

- ▶ EN ISO 13849-1
- ▶ EN ISO 12100
- ▶ EN IEC 62061

Correct use includes observing the relevant requirements for installation and operation, e.g.:

- ▶ EN ISO 14119
- ▶ EN IEC 60204-1

### Important!

- ▶ The user is responsible for safe integration of the device into a safe overall system. For this purpose, the overall system must be validated, e.g. in accordance with EN ISO 13849-1.
- ▶ Correct use requires observing the permissible operating parameters (see technical data).
- ▶ If a data sheet is included with the product, the information on the data sheet applies in case of discrepancies with the operating instructions.

## Exclusion of liability and warranty

In case of failure to comply with the conditions for correct use stated above, or if the safety regulations are not followed, or if any servicing is not performed as required, liability will be excluded and the warranty void.

## General safety precautions

Safety components fulfill personnel protection functions. Incorrect installation or tampering can lead to severe injuries to personnel.

Check the safe function of the guard particularly

- ▶ after any setup work
- ▶ each time after replacement of a CMS component
- ▶ after an extended period without use
- ▶ after every fault

Independent of these checks, the safe function of the safeguard should be checked at suitable intervals as part of the maintenance schedule.

**Warning!** Danger of fatal injury in the event of incorrect connection or incorrect use.

Safety components must not be bypassed (bridging of contacts), turned away, removed or otherwise rendered ineffective. Pay particular attention to EN ISO 14119: 2025, section 8, regarding the possibilities for bypassing an interlocking device.

The device may be installed and put into operation only by authorized personnel

- ▶ who are familiar with the correct handling of safety components
- ▶ who are familiar with the applicable EMC regulations
- ▶ who are familiar with the applicable regulations on operational safety and accident prevention
- ▶ who have read and understood the operating instructions.
- ▶ All safety precautions and requirements stated in the operating instructions of the AS-Interface safety monitor used must be observed.

## Function

The non-contact safety switch CMS...AS1 consists of two components:

- ▶ Coded actuator
- ▶ Read head

The read head includes reed contacts that are activated via the coded, magnetic actuator. It is equipped with a plug connector and is connected directly to the safety bus AS-Interface Safety at Work.

The read head is fastened to the fixed part of the guard. The actuator attached to the movable part of the guard is moved toward the read head by closing the door.

When the operating distance is reached, a bit sequence is sent via the AS-Interface bus that signals that the guard is closed.

The zero sequence 0000 is sent via the AS-Interface bus when the guard is opened.

## Mounting

**Caution!** Risk of damage to equipment as a result of incorrect installation.

Read heads or actuators must not be used as a mechanical end stop. Fit an additional end stop for the movable part of the guard.

**Caution!** Read heads or actuators must not be used in an environment with strong magnetic fields.

**Important!** Read heads and actuators must be positively mounted to the guard, e.g. by using the safety screws supplied. Tighten the screws with a torque of max. 0.5 Nm.

The read head and actuator may be installed in any position. The alignment of the read head and the actuator must be kept in mind (see Fig. 1).

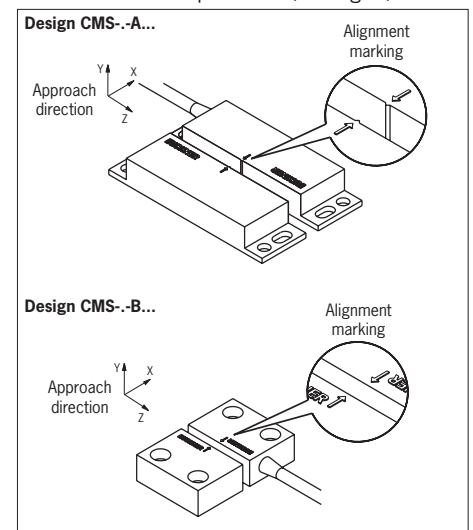


Fig. 1: Alignment of read head and actuator

Install read head and actuator so that:

- ▶ they are accessible for inspection work and the installation of spare parts
- ▶ when the guard is closed, the active read head and actuator faces are exactly aligned (see Fig. 1)
- ▶ the actuator is located in the read head's actuating range when the guard is closed.
- ▶ A guide and an additional end stop must be fitted for the movable part of the guard.
- ▶ A latching mechanism in the closed position must be provided for the safety door.
- ▶ If the read head and actuator are installed flush, the operating distances are reduced in line with the installation depth and the guard material.
- ▶ If the read head and actuator are fitted on ferromagnetic material, the read distance is reduced.
- ▶ If the approach speed between the read head and the actuator is low, the approach direction Z (see Fig. 1) should be avoided.

## Electrical connection

The devices are tested according to the requirements of UL508.

Tests regarding EMC and FMEA or tests for use in safety circuits are performed by TÜV Süd.

This device is intended to be used with a Class 2 power source in accordance with UL1310..

Alternative solutions must comply with the following requirements:

This device shall be used with a suitable isolating source in conjunction with a fuse in accordance with UL248. This fuse should be designed for max. 3 A and should be integrated into the 33.3 V/DC voltage section.

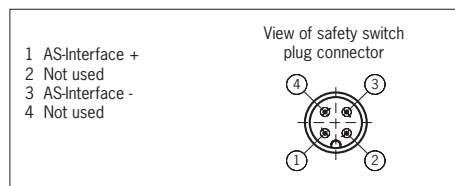


Fig. 2: Terminal assignment, AS-Interface M12 plug connector

## Addressing

The device can be addressed via the AS-Interface safety bus.

## Configuration in the AS-Interface safety monitor

(see operating instructions for the AS-Interface safety monitor)

The safety switch is configured in the AS-Interface safety monitor with the AS-Interface address set as follows, for example:

- Dual-channel dependent
- With start-up test
- Synchronization time = 3 seconds

In this operating mode, the guard must be opened each time prior to restarting in order to perform the start-up test.

## AS-Interface status messages

(only for CMS-RAZA...AS1)

A dual LED (red/green) displays the colors red, green and yellow. The following table provides assistance with troubleshooting.

| State of ASI LED                | Explanation   |
|---------------------------------|---|
| green                           | Normal operation  |
| red                             | No data exchange between master and slave<br>Cause:<br>- Master in STOP mode<br>- Slave not in LPS<br>- Slave with wrong IO/ID<br>- Reset on slave active |
| red/yellow alternately flashing | No data exchange between master and slave<br>Cause: slave address=0   |
| red/green alternately flashing  | Device fault in the slave.  |
| red flashing                    | Contact EUCHNER.  |

An additional function LED can be connected via the AS-Interface bus, e.g. to indicate the door state. The LED is connected as an output to the AS-Interface bus via bit D1.

## Function test

### WARNING

Fatal injury due to faults during the function test.

Before carrying out the function test, make sure that there are no persons in the danger area.

- Observe the valid accident prevention regulations.
- Check the device for correct function after installation and after every fault.

Proceed as follows:

Electrical function test

1. Switch on operating voltage.
  2. Close all guards.
  - The machine must not start automatically.
  3. Start the machine function.
  4. Open the guard.
  - The machine must switch off and it must not be possible to start it as long as the guard is open.
- Repeat steps 2 - 4 for each guard.

## Service and inspection

Remove iron swarf from the read head and actuator at regular intervals.

Use only solvent-free cleaning agents for cleaning the read heads and actuators.

**Regular inspection** of the following is necessary to ensure trouble-free long-term operation:

- Correct switching function
- Secure mounting of components
- loose connections.

⚠ In the event of damage or wear, the damaged system component must be replaced.

## Exclusion of liability under the following circumstances:

- Incorrect use
- Non-compliance with safety regulations
- Installation and electrical connection not performed by authorized personnel
- failure to perform functional checks.

## Declaration of conformity

The product complies with the requirements according to

- Machinery Directive 2006/42/EC (until January 19, 2027)
- Machinery Regulation (EU) 2023/1230 (from January 20, 2027)

The EU declaration of conformity can be found at [www.euchner.com](http://www.euchner.com). Enter the order number of your device in the search box. The document is available under *Downloads*.

## Service

If servicing is required, please contact:

EUCHNER GmbH + Co. KG  
Kohlhammerstraße 16  
70771 Leinfelden-Echterdingen

**Service telephone:**  
+49 711 7597-500

**E-mail:**  
[support@euchner.de](mailto:support@euchner.de)

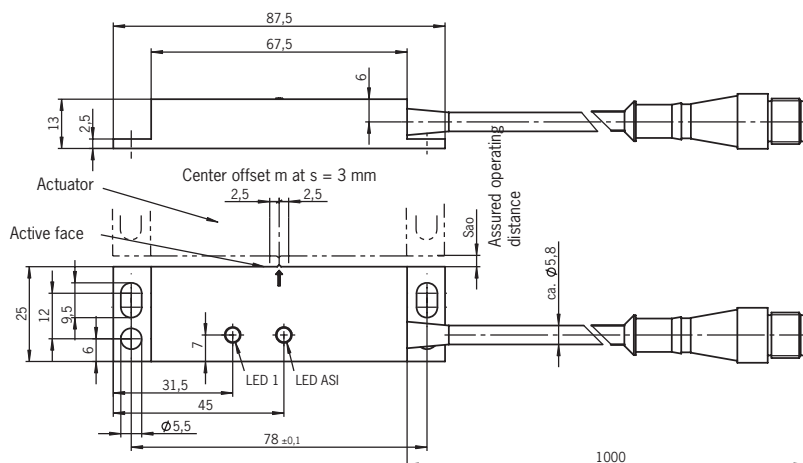
**Internet:**  
[www.euchner.com](http://www.euchner.com)

## Technical data

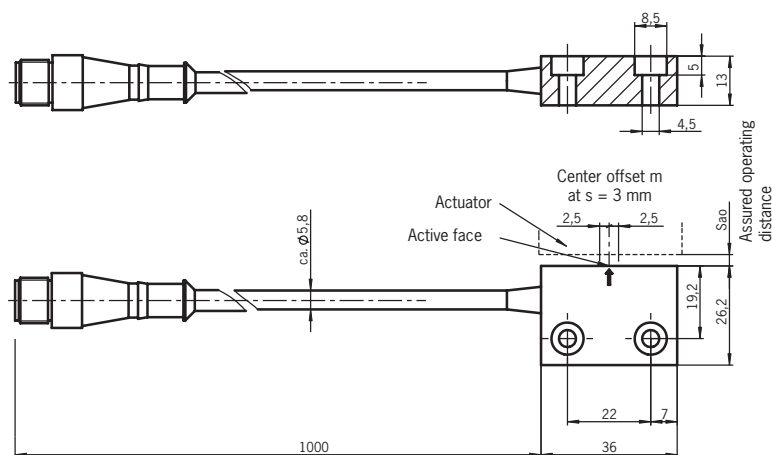
| Parameter  | Value   |              |
|--|---|--------------|
| Read head  |   |              |
| Housing material   | Fiberglass reinforced PPS                                       |              |
| Ambient temperature                                      | -20 ... +60 °C  |              |
| Degree of protection                                     | IP67  |              |
| Installation position                                    | Any, alignment with actuator should be kept in mind (markings)  |              |
| Connection   | Connecting cable with M12 plug connector                        |              |
| Cable length   | 1 m   |              |
| Cable material   | PUR   |              |
| Method of operation                                      | Magnetic, reed contact  |              |
| Mechanical life  | 100 x 10 <sup>6</sup> operating cycles                          |              |
| Shock and vibration resistance                           | Acc. to EN IEC 60947-5-3  |              |
| Actuator   |   |              |
| Housing material   | Fiberglass reinforced PPS                                       |              |
| Ambient temperature                                      | -20 ... +60 °C  |              |
| Degree of protection                                     | IP67  |              |
| Installation position                                    | Any, alignment with read head should be kept in mind (markings) |              |
| Method of operation                                      | Magnetic  |              |
| Shock and vibration resistance                           | Acc. to EN IEC 60947-5-3  |              |
| AS-Interface data acc. to AS-Interface specification 3.2 | EA code: 7<br>D code: B   |              |
| Operating voltage, AS-Interface                          | DC 26.5 ... 31.6 V  |              |
| Total current consumption, max.                          | 30 mA   |              |
| Valid AS-Interface addresses                             | 1 - 31  |              |
| AS-Interface inputs                                      | Acc. to AS-Interface Safety at Work                             |              |
| Switch actuated  | D0, D1, D2, D3 code sequence                                    |              |
| Switch open  | D0, D1, D2, D3 zero sequence                                    |              |
| AS-Interface outputs                                     | Acc. to AS-Interface Safety at Work                             |              |
| Output D1  | D1 = 1 ⇒ LED ON<br>D1 = 0 ⇒ LED OFF                             |              |
| Distances  |   |              |
| with read head   | CMS...AZA...  | CMS...BZB... |
| Operating distance S <sub>ao</sub>                       | 9 mm  | 7 mm         |
| Assured release distance s <sub>ar</sub>                 | 70 mm   | 40 mm        |
| Center offset m between actuator and read head           | ± 2.5 mm at distance s = 3 mm                                   |              |
| Times  |   |              |
| Time-delay max. from state change                        | 5 ms  |              |
| Characteristics acc. to EN ISO 13849-1                   |   |              |
| Category   | 3   |              |
| Performance Level (PL)                                   | e   |              |
| PFH  | 4.29 x 10 <sup>-8</sup>   |              |
| Mission time   | 20 years  |              |



## CMS-R-AZA-01PL-AS1 CMS-M-AC



## CMS-R-BZB-01P-AS1 CMS-M-BH



The dimensions of the actuators are the same as those of the read heads, although the former have no connecting cable.

Fig. 3: Dimension drawings for read heads and actuators