Operating Instructions
Read Head CEM-A-LE05H-S2

EUCHNER

Scope

These operating instructions apply to all read heads CEM-A-LE05H-S2 of version 1.2.X. 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. Please contact the EUCHNER service team if you have any questions.

Supplementary documents

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

Document title (document number)	Contents	
Safety information (2525460)	Basic safety information	
Operating instructions (2110030)	(this document)	www
Declaration of conformity	Declaration of conformity	www
Any additions to the operating instructions	Take any associated additions to the operating instructions or data sheets into account.	www

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. For this purpose, enter the doc. no. or the order number for the device in the search box.

Correct use

Read heads of series CEM-A are operated in combination with an evaluation unit in the system family CES-A-…B or CES-AZ-…B. In this combination, the read head CEM-A is an interlocking device with electromagnetic guard locking without guard lock monitoring (type 4). The coding level depends on the evaluation unit used (unicode or multicode evaluation). The combination is not allowed to be used as guard locking for personnel protection according to EN ISO 14119.

In combination with a movable guard and the machine control, this system prevents dangerous machine functions from occurring while the guard is open. A stop command is triggered if the guard is opened during the dangerous machine function.

This means:

- Starting commands that cause a dangerous machine function must become active only when the guard is closed.
- Opening the guard triggers a stop command.
- Closing a guard must not cause automatic starting of a dangerous machine function. A separate start command must be issued. For exceptions, refer to EN 12100 or relevant C-standards.

Before use, a risk assessment must be performed on the machine, e.g. according to the following standards:

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

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

- EN ISO 13849-1
- EN ISO 14119
- EN 60204-1

The read head must be used only in conjunction with the designated actuator from EUCHNER. If different actuators or other connection components are used, EUCHNER provides no warranty for safe function.

The read head CEM must be operated only in combination with evaluation units in the system family CES-A-…B or CES-AZ-…B.

Please check this in the “Combination options” table in the operating instructions for the evaluation unit used.

Important!

- The user is responsible for the integration of the device in 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.
- The PL that can be achieved depends on the evaluation unit used.

General safety precautions

Safety switches fulfill personnel protection functions. Incorrect installation or tampering can lead to fatal injuries to personnel.

Check the safe function of the guard particularly

- after any setup work
- after the replacement of a system component
- after an extended period without use
- after every fault

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

⚠ WARNING

Danger to life due to improper installation or due to bypassing (tampering). Safety components fulfill a personnel protection function.

- Safety components must not be bypassed, turned away, removed or otherwise rendered ineffective. On this topic pay attention in particular to the measures for reducing the possibility of bypassing according to EN ISO 14119:2025, section 8.
- The switching operation must be triggered only by actuators designated for this purpose.
- Prevent bypassing by means of replacement actuators (only for multicode evaluation). For this purpose, restrict access to actuators and to keys for releases, for example.
- Mounting, electrical connection and setup only by authorized personnel possessing the following knowledge:
  - specialist knowledge in handling safety components
  - knowledge about the applicable EMC regulations
  - knowledge about the applicable regulations on operational safety and accident prevention.

Function

The read head CEM behaves like a read head CES (see operating instructions for the evaluation unit used). As soon as the actuator reaches the actuating range of the read head, a signal is sent to the evaluation unit.

CEM read heads additionally feature a solenoid to produce the adhesive force and the locking force. The guard locking is not monitored.

The guard locking solenoid is pre-excited to achieve the adhesive force. This provides this read head with adhesive force even when guard locking is inactive.

The adhesive force can be set in steps of 70 N, 110 N and 150 N with the aid of a programming adapter (see section “Setting adhesive force”).

The guard locking is activated when, in addition to operating voltage U_B, the control voltage U_{CM} is present (open-circuit current principle).

The LED on plug connector X1 is illuminated when voltage is applied to the solenoid.

Mounting

NOTICE

Device damage due to improper mounting and unsuitable ambient conditions.

- Safety switches and actuators are allowed to be used as an end stop. Observe the max. permissible impact energy (see technical data).
- When the safety door is opened, the actuator must be moved away from the read head toward the front (see Fig. 1).
- Observe EN ISO 14119:2025, sections 6.2 and 6.3, for information about mounting the safety switch and the actuator.
- Observe EN ISO 14119:2025, section 8, for information about reducing the possibilities for bypassing an interlocking device.

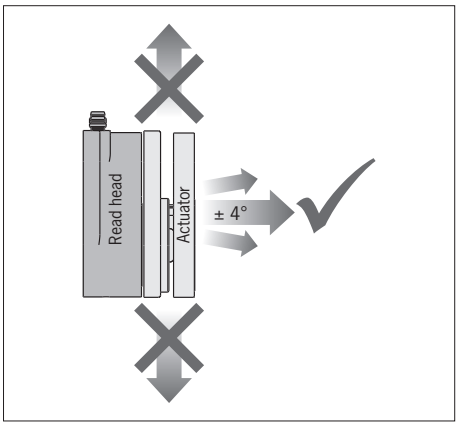


Fig. 1: Approach direction

Protection against environmental effects

Dirt on the surfaces of the read head and actuator can reduce the adhesive force and the locking force. Clean the surfaces at regular intervals.

Cover the read head, the actuator and the type label during painting work!

Electrical connection

NOTICE

- All the electrical connections must either be isolated from the mains supply by a safety transformer according to IEC EN 1558-2-6 with limited output voltage in the event of a fault or by other equivalent insulation measures.
- If a common power supply is used, all the inductive and capacitive loads (e.g. contactors) connected to the power supply must be connected to appropriate interference suppression units.

- For terminal assignment, see Fig. 4.
- For detailed information, see the operating instructions for the evaluation unit used.

Setup and functional check

Observe the information in the operating instructions for the respective evaluation unit during setup.

⚠ WARNING

Danger of fatal injuries as a result of faults in installation and functional check.

- Before carrying out the functional check, make sure that there are no persons in the danger area.
- Observe the valid accident prevention regulations.

After installation and any fault, the safety function must be fully checked. Proceed as follows:

- Switch on operating voltage.
  The machine must not start automatically.
- Close all guards.

- Test the adhesive force by opening the guard. For this purpose, the operating voltage +UB must be applied to the device; the control voltage UCM is switched off. In the default setting on delivery, the adhesive force is approx. 110 N. You can increase or decrease the adhesive force if necessary (see section “Setting adhesive force”).
- Close the guard again and activate the guard locking.
- Test the locking force by trying to open the guard. The locking force of 650 N is attained when UCM is applied.

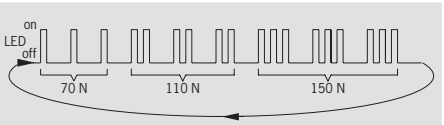
Setting adhesive force

To change the preset adhesive force, you will need a programming adapter (order no. 110013).

Proceed as follows:

- Remove cable from plug connector X1.
- Connect programming adapter to plug connector X1.
- Connect the connecting cable to the programming adapter and switch on the operating voltage (UB).

  The CEM is in programming mode and successively clocks through the adjustment ranges (see table). This process repeats itself until the operating voltage (UB) is switched off.



Flashing sequence (respectively displayed three times)	Adhesive force
Flashing 1x	Approx. 70 N
Flashing 2x	Approx. 110 N
Flashing 3x	Approx. 150 N

- Wait until the flashing sequence indicates the correct adhesive force and remove the programming adapter before the device changes to the next flashing sequence.

  The corresponding adhesive force is saved and is available the next time the device is put into operation.

Service and inspection

⚠ WARNING

Loss of the safety function because of damage to the device.

- In case of damage, the related safety component must be replaced. The replacement of individual parts in a safety component is not permitted.

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

- Check the switching function
- Check the secure mounting of the devices and the connections
- Check for contamination
- Check for sealing of the plug connector on the safety switch
- Check for loose cable connections on the plug connector
- Check the release distance

No servicing is required. Repairs to the device are only allowed to be made by the manufacturer.

NOTICE

The year of manufacture can be seen in the lower right corner of the type label.

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.

Technical data

Read head

Parameter	Value
Housing material - Read head CES - Solenoid	Aluminum Plastic (PPS) Steel, nickel plated
Weight	0.3 kg
Mechanical life	1 x 10^6 (closing cycles)[1]
Installation position	Any
Degree of protection	IP67
Ambient temperature	-25 … +50 °C
Actuating range	
- Assured release distance S_{ar} for center offset m = 0 mm	20 mm
- Switching hysteresis for center offset m = ± 2.5 mm	0.7 mm
- Assured operating distance S_{ao}	0 mm
Connection to evaluation unit (plug connector X3)	Plug connector M8 (male socket, 3-pin), suitable for snap-action and screw terminals
Max. cable length	25 m
Solenoid	
Adhesive force, adjustable	70 N, 110 N (factory setting), 150 N
Locking force	650 N (not monitored)
Max. permissible center offset between solenoid and anchor plate	± 2.5 mm
Operating voltage U_B (plug connector X1)	DC 24 V +10%, -15% reverse polarity protected
Current consumption at connection X1.2 (U_B) at - U_{CM} = 24 V - U_{CM} = 0 V	 100 mA 25 mA
Duty cycle	100%
Connection rating	Approx.2.8 W
Operating voltage connection U_B (plug connector X1)	Plug connector M8 (male socket, 4-pin) LED, yellow, integrated into the plug (see circuit diagram)

1) At an impact energy of max. 2 Joule

Actuator CEM-A-BE05…

Parameter	Value
Material - Housing - Active face - Anchor plate	 Aluminum Plastic (PA6) Steel, nickel plated
Weight	Approx. 0.18 kg
Installation position	Active face opposite CES read head
Degree of protection	IP67
Ambient temperature	-25 … +50 °C
Adjustment angle (around point X, see dimension drawing)	± 4°

Typical operating distance

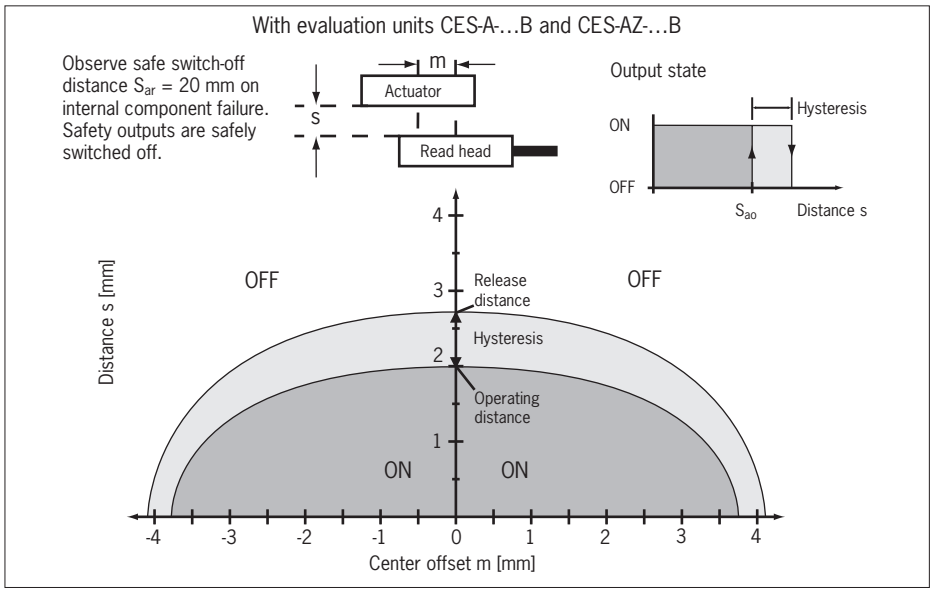


Fig. 2: Typical operating distance

Dimension drawing

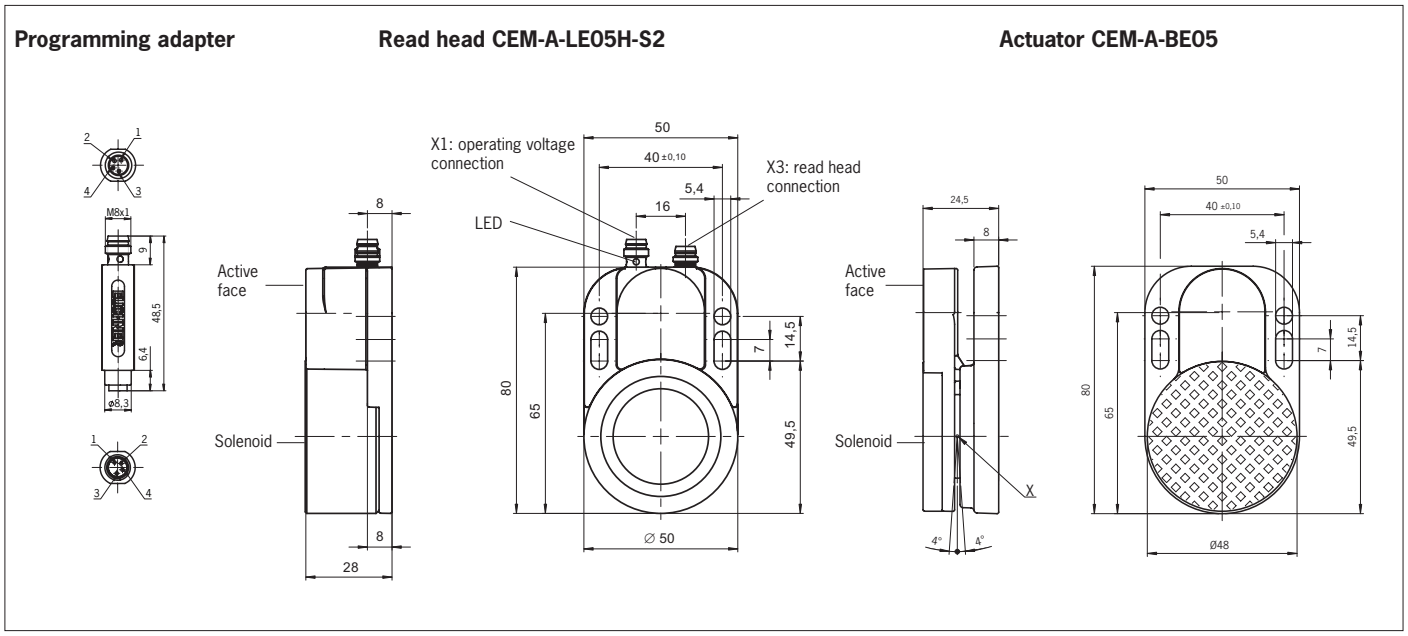
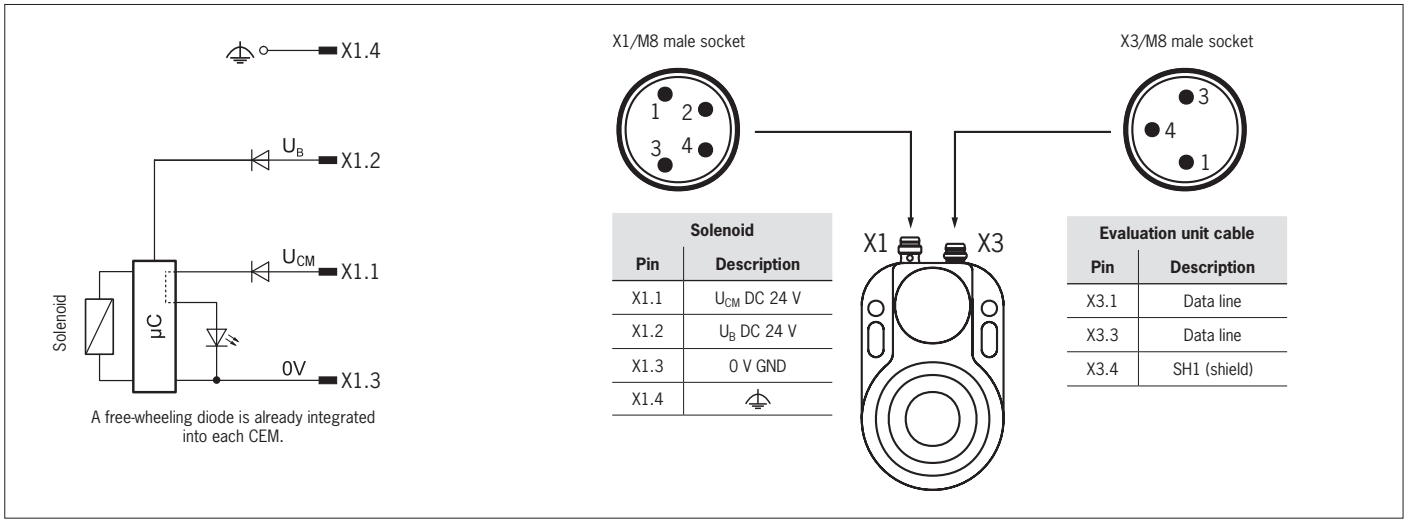


Fig. 3: Dimension drawing

Terminal assignment



Solenoid	
Pin	**Description**
X1.1	U_{CM} DC 24 V
X1.2	U_B DC 24 V
X1.3	0 V GND
X1.4	⏚

Evaluation unit cable	
Pin	**Description**
X3.1	Data line
X3.3	Data line
X3.4	SH1 (shield)

Fig. 4: Terminal assignment