Operating Instructions
Variable Magnetic Guard Locking Device CEM-C60

EUCHNER

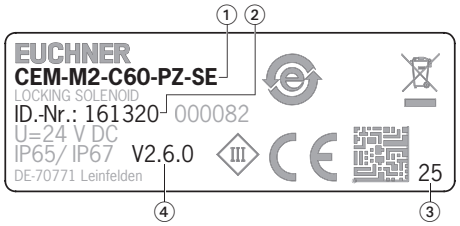
Scope

These operating instructions are valid for all CEM-C60 of version V1.0.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. The version numbers can be found on the type label of your product. Please contact the EUCHNER support team if you have any questions.

Type label CEM-C60



① Item designation

② Item number

③ Year of manufacture

④ Version

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 (2525844)	(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. For this purpose, enter the doc. no. or the order number for the device in the search box.

Correct use

Guard locking solenoids and actuators from series CEM-C60 are operated in combination with a safety switch from series CES-C04 or CES-C07. In this combination, the CEM-C60 is an interlocking device with electromagnetic guard locking without guard lock monitoring (type 4). The coding level depends on the safety switch 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 activated 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 IEC 60204-1

Important:

- The CEM-C60 may be operated only with safety switches from the system family CES-C04 or CES-C07 (see Fig. 4 *Combination options* on *Page 3*).
- The safety switch 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 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 safety switch used.

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 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.

Refer to the respective operating instructions for all technical data of the respective safety switch (CES-C04/CES-C07). Deviating information can be found in the technical data.

⚠ 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 activated 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.
- 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 variable magnetic guard locking device CEM-C60 consists of guard locking solenoid, safety switch and actuator and is functional only in particular combinations (see combination options).

The safety switch monitors the position of movable guards. The safety outputs are switched on/off when the actuator is moved to/removed from the actuating range.

CEM guard locking solenoids additionally feature a solenoid to produce the locking force. The guard locking is not monitored (guard locking for process protection).

Version with remanence

The guard locking is activated as soon as the control voltage U_{CM} is present (open-circuit current principle).

The solenoid retains a slight residual magnetism after it is switched off. This decreases over time. This process is faster when the safety door is open than when it is closed.

Version with remanence and permanent magnet

A permanent magnet is installed in the CEM guard locking solenoid with this version.

The guard locking is activated as soon as the control voltage U_{CM} is present (open-circuit current principle). After the solenoid switches off, the permanent magnet's attractive force acts between the CEM guard locking solenoid and the magnetic mating plate of the CEM actuator.

LED

The CEM-C60 features an integrated LED.

The LED illuminates when voltage is applied to the solenoid.

Mounting

NOTICE

Device damage due to improper mounting and unsuitable ambient conditions.

- CEM-C60 and actuator may 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 guard locking solenoid 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.

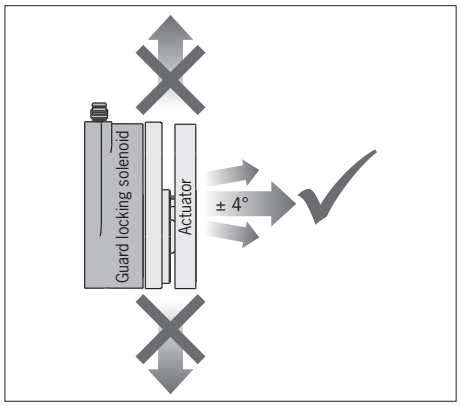


Fig. 1: Approach direction

Protection against environmental effects

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

Cover the guard locking solenoid, 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 61558-2-6 with limited output voltage in the event of a fault, or by other equivalent isolation 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. 3.

- For detailed information, see the operating instructions for the safety switch used.

Notes on c UL us

This device is intended to be used with a Class 2 power source in accordance with UL 1310.c UL us

As an alternative an LV/C (Limited Voltage/Current) power source with the following properties can be used:

- This device shall be used with a suitable isolating source in conjunction with a fuse in accordance with UL248. The fuse shall be rated max. 3.3 A and be installed in the max. 30 V/DC power supply to the device in order to limit the available current to comply with the UL requirements.c UL us Please note possibly lower connection ratings for your device (refer to the technical data).

For use and application as per the requirements of UL [1] a connecting cable listed under the UL category code CYJV/7 must be used.c UL us

1) Note on the scope of the UL approval:
The devices have been tested as per the requirements of UL508 and CSA/C22.2 no. 14 (protection against electric shock and fire).

Setup and functional check

Observe the information in the operating instructions for the respective safety switch 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.
- Activate the guard locking.
- Test the locking force by trying to open the guard.
  The locking force of 650 N is attained when U_{CM} is applied.

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 operating distances.

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

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. Enter the order number of your device in the search box. The document is available under *Downloads*.

Service

If servicing is required, please contact:

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Technical data

Guard locking solenoid CEM-M2-C60-…

Parameter	Value
Material - Housing - Solenoid	 Aluminum, painted black Steel, nickel plated
Weight	Approx. 0.45 kg
Mechanical life	1 x 10^6 (closing cycles) [1]
Installation position	Any
Degree of protection	IP65, IP67
Ambient temperature	-25 … +50 °C
Operating distance for center offset m = 0 - Assured release distance s_{ar} - Assured operating distance s_{ao} - Switching hysteresis	 17 mm [2] / 40 mm [3] 2 mm [2] / 5 mm [3] 0.7 mm
Typical center offset for transponder detection (reduced locking force from ±2.5 mm) at room temperature	±10 mm
Solenoid	
Locking force (not monitored) up to a center offset of ±2.5 mm	650 N
Adhesive force due to permanent magnet	30 … 45 N
Adhesive force due to remanence	10 N ±25%
Max. permissible center offset between solenoid and mating plate	± 2.5 mm
Control voltage U_{CM} (plug connector X1.4)	DC 24 V +10%, -15% reverse polarity protected with free-wheeling diode
Current consumption - at connection X1.4 (U_{CM})	 100 mA
Duty cycle	100%
Connection rating	Approx.2.4 W
Solenoid operating voltage connection	Plug connector M12 (male socket, 5-pin) LED, yellow (see circuit diagram)

1) At an impact energy of max. 1 Joule
2) In combination with CES-C07
3) In combination with CES-C04

Actuator A-C60-…

Parameter	Value
Material - Housing - Actuator (active face/transponder) - Solenoid plate	 Aluminum Plastic (PA6) Steel, nickel plated
Weight	Approx. 0.2 kg
Installation position (transponder installed in actuator)	Active face opposite CES safety switch
Degree of protection	IP65, IP67
Ambient temperature	-25 … +50 °C
Adjustment angle (see Fig. 1)	± 4°

Dimension drawing

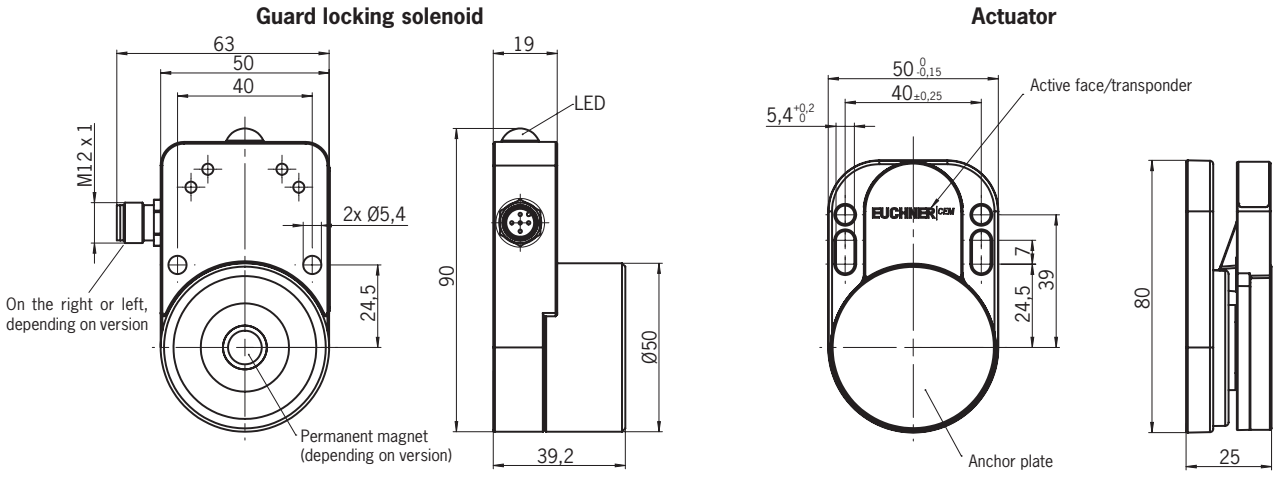

Fig. 2: Dimension drawings

Terminal assignment

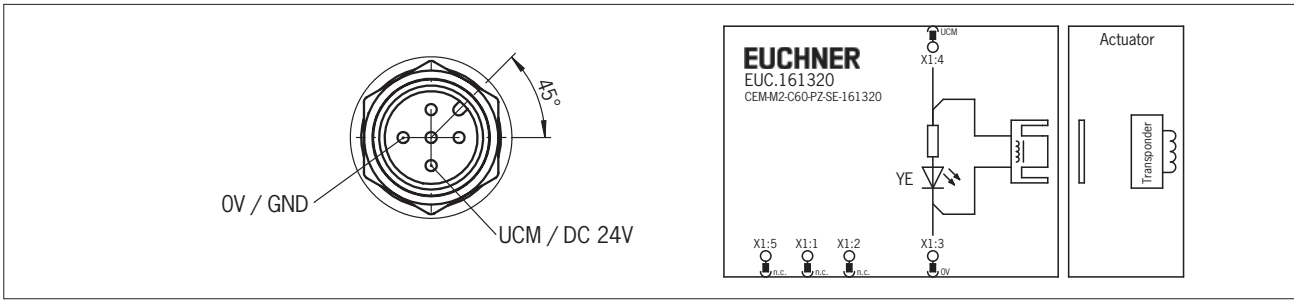

Fig. 3: Terminal assignment

Combination options

Guard locking solenoid	Safety switch	Actuator	Application
CEM-M2-C60-PZ-SE-161320 (with permanent magnet) **CEM-M2-C60-PZ-SE-165746** (with permanent magnet) **CEM-M2-C60-KZ-SE-163252** (without permanent magnet)	**CES-C04**	**A-C60-A1-161322**	
	CES-C07	**A-C60-B1-162581**	

Fig. 4: Combination options