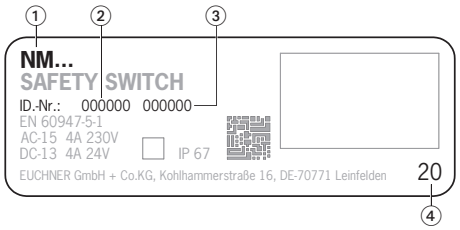
Scope

These operating instructions are valid for all NM..HB. 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
② Item number
③ Serial number
④ Year of manufacture

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 (2084462)	(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

Safety switches series NM are interlocking devices without guard locking (type 1). The actuator is uncoded (e.g. dogs). In combination with a movable guard and the machine control, this safety component 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 ISO 12100 or relevant C-standards.

Devices from this series can be used as safe position encoders.

Before the device is used, a risk assessment must be performed on the machine, e.g. in accordance with the following standards:

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

Correct use includes observing the relevant requirements for installation and operation, particularly based on the following standards:

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

Important!

- The user is responsible for the proper 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.
- If the simplified method according to section 6.2.3 of EN ISO 13849-1:2023 is used for determining the Performance Level (PL), the PL might be reduced if several devices are connected in series.
- The logical series connection of safe contacts may limit the achievable Performance Level (PL) in certain circumstances. More information about this is available in EN ISO 14119:2025, section 9.4.
- If a data sheet is included with the product, the information on the data sheet applies in case of discrepancies with the operating instructions.

Safety precautions

⚠ 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.
- Mounting, electrical connection and setup only by authorized personnel possessing special knowledge about handling safety components.

Function

The safety switch monitors the position of movable guards.

The switching contacts are actuated when the actuating element is moved from the free position to the end position. The safety contacts ⊖ are positively opened in this process (see Fig. 7).

Switching states

The detailed switching states for your switch can be found in Fig. 7. All available switching elements are described there.

Actuating element in free position

The safety contacts ⊖ are closed.

Actuating element in end position

The safety contacts ⊖ are open.

Mounting

NOTICE

Device damage due to improper mounting and unsuitable ambient conditions.

- Safety switches and actuators must not be used as an end stop.
- 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.
- Protect the switch head against damage.
- For the safety circuits, observe the actuating travel with the tolerances on the dimension drawing.
- The specified IP degree of protection is applicable only if the housing screws, cable entries and plug connectors are properly tightened. Observe the tightening torques.

Changing the actuating direction

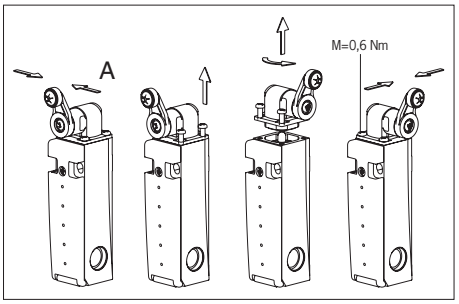


Fig. 1: Changing the actuating direction

1. Remove the screws from the actuating head.
2. Set the required direction.
3. Tighten the screws with a torque of 0.6 Nm.

Electrical connection

⚠ WARNING

Loss of the safety function due to incorrect connection.

- Use only safe contacts (⊖) for safety functions.
- Strip the insulation from the ends of the individual wires over a length of $6^{\pm 1}$ mm to ensure a safe contact.

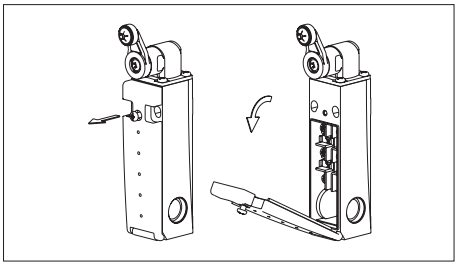


Fig. 2: Opening the safety switch

Use of the safety switch as an interlocking device for personnel protection

At least one contact ⊖ must be used. This signals the position of the guard (for terminal assignment, see Fig. 7).

The following information applies to devices with cable entry:

1. Break out the required insertion opening.
2. Mount the cable gland with the appropriate degree of protection.
3. Connect and tighten terminals with 0.5 Nm (for terminal assignment, see Fig. 7).
4. Check that the cable entry is sealed.
5. Close the switch cover and screw in place (tightening torque 0.6 Nm).

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:

Mechanical function test

The actuating element must move easily. Close the guard several times to check the function.

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.

Inspection and service

⚠ WARNING

Danger of severe injuries due to the loss of the safety function.

- If damage or wear is found, the complete switch must be replaced. Replacement of individual parts or assemblies is not permitted.
- Check the device for proper function at regular intervals and after every fault. For information about possible time intervals, refer to EN ISO 14119:2025, section 9.2.1.

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

- Correct switching function
- Secure mounting of all components
- Damage, heavy contamination, dirt and wear
- Sealing of cable entry
- Loose cable connections or plug connectors.

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.

Notes about UL

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

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. As per the requirements of UL, this fuse must be rated as follows:

- Max. 5 A at a secondary voltage between 0 V and 20 V DC (0 V - 28.3 V AC peak) or
- The power in the secondary circuit must not exceed 100 VA at a secondary voltage of 20 V - 30 V DC (28.3 V - 42.4 V AC peak).

Please note the connection ratings for your device (refer to the technical data).

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).

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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Kohlhammerstraße 16
70771 Leinfelden-Echterdingen
Germany

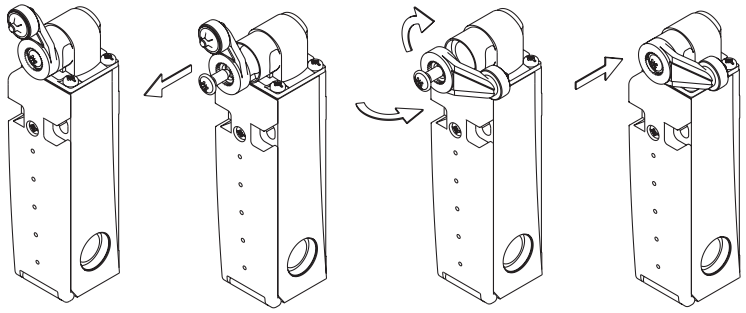
Service telephone:
+49 711 7597-500

E-mail:
support@euchner.de

Internet:
www.euchner.com

Technical data

Parameter	Value
Housing material	Reinforced thermoplastic
Degree of protection	IP67
Mech. operating cycles	20 x 10^6
Ambient temperature	-20 … +80 °C
Degree of contamination	3 (industrial)
Installation position	Any
Approach speed, max.	60 m/min
Actuating force at 20 °C	0.1 N
Actuation frequency, max.	5,000/h
Switching principle	Slow-action switching contact
Contact material	Silver alloy, gold flashed
Connection	Cable entry M16 x 1.5 Plug connector M12, 4-pin
Conductor cross-section (rigid/flexible)	0.34 mm^2 … 1.5 mm^2
Rated impulse withstand voltage	U_{imp} = 2.5 kV
Rated insulation voltage	U_i = 250 V
Conditional short-circuit current	100 A
Switching voltage, min., at 10 mA	12 V
Utilization category	
AC-15	4 A 230 V
DC-13	4 A 24 V
Switching current, min., at 24 V	1 mA
Short circuit protection (control circuit fuse)	4 A gG
Convent. thermal current I_{th}	4 A
Characteristics acc. to EN ISO 13849-1	
Safe position sensing	
B_{10D} at DC-13 100 mA/24 V	2 x 10^7



The lever arm can be adjusted to positions every 10°. Depending on the application, the lever with roller can also be rotated to the outside or the inside. After setting the required approach direction, fasten the lever arm using the screw.

Fig. 3: Changing the lever arm

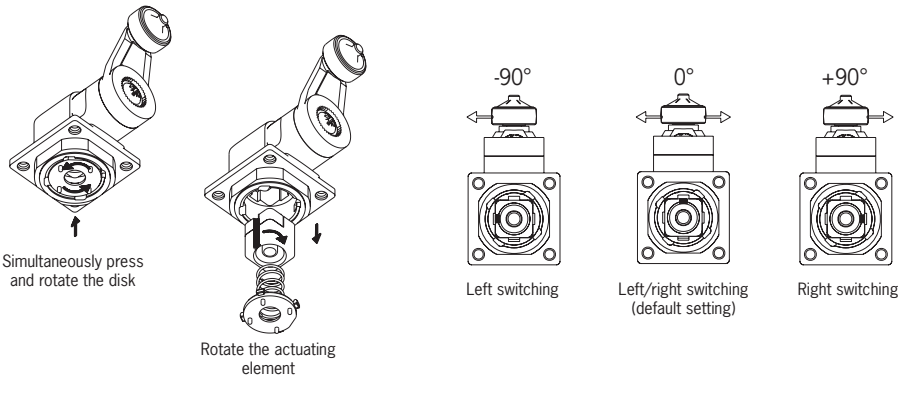


Fig. 4: Changing the switching direction

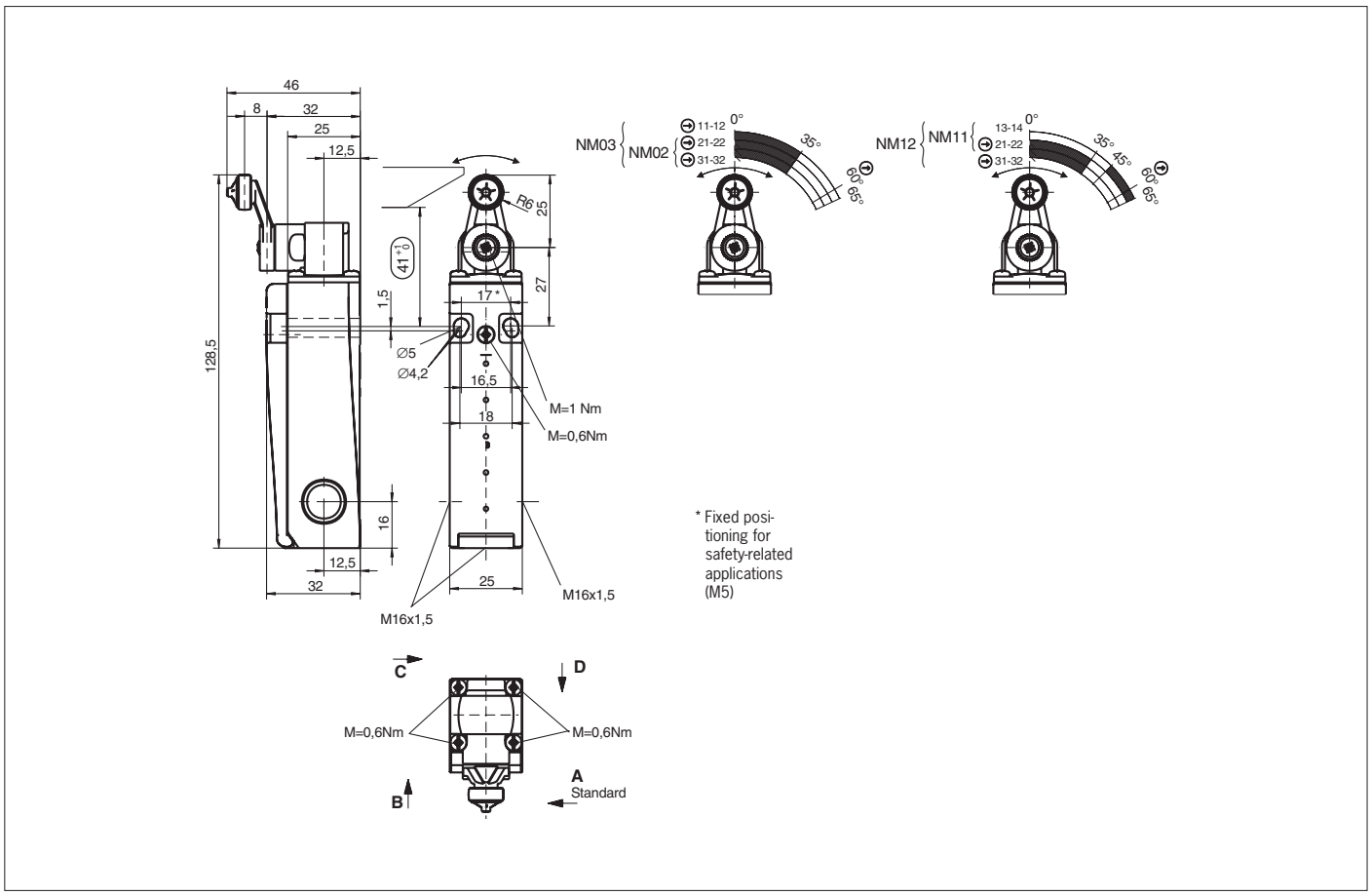


Fig. 5: Dimension drawing and travel diagrams for NM11HB / NM02HB / NM12HB / NM03HB

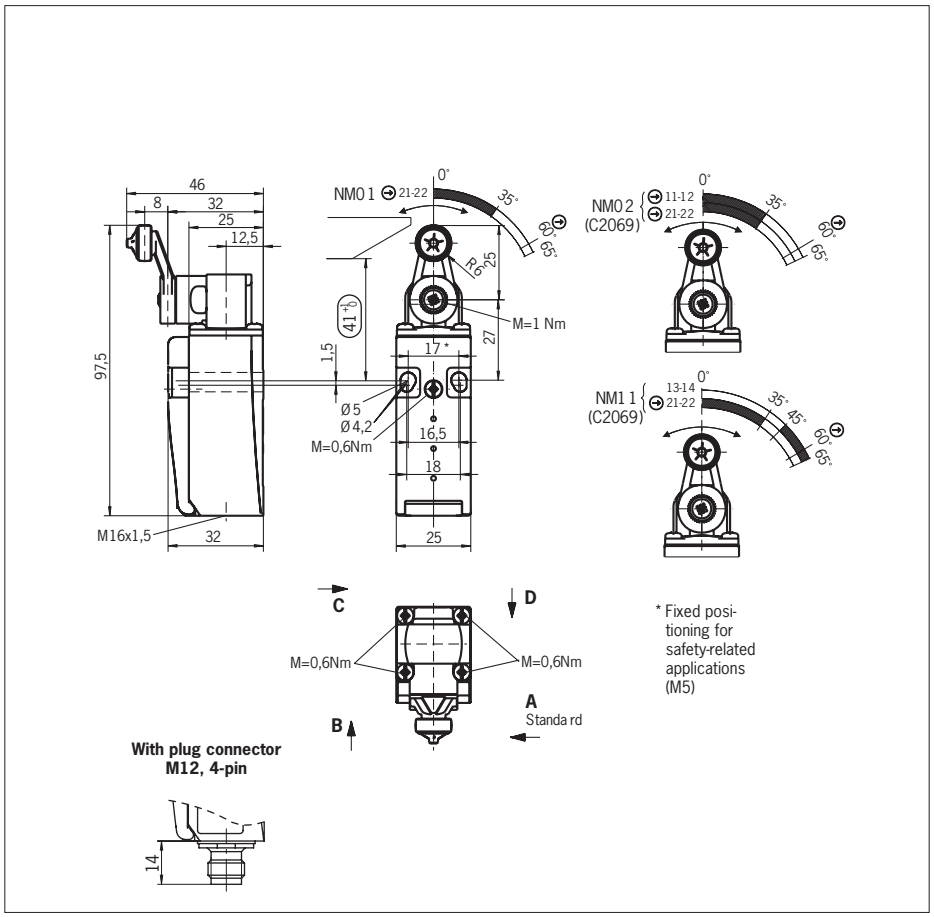


Fig. 6: Dimension drawing and travel diagrams for NM01HB, NM...HB...C2069

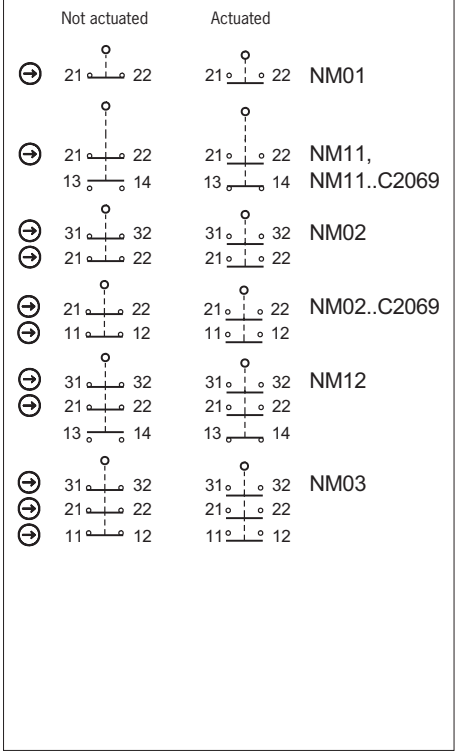


Fig. 7: Switching elements and switching functions